# FRITZ!Box
## Fon WLAN**7170**

# Installation, configuration and operation

AVM

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## FRITZ!Box Fon WLAN 7170

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# Contents

# Symbols and Highlighting

This manual uses the following symbols for warnings and tips:

This symbol indicates important instructions that must be observed to avoid malfunctions.

This symbol marks useful hints to assist you in working with the FRITZ!Box.

The table below explains the highlighting used in this manual.

| Highlighting | Function | Examples |
|---|---|---|
| Quotation marks | Keys | "F1" key |
| | Buttons | "Help" |
| | Settings Pages | "hardware" |
| | Menus | "Start / Programs" |
| | Commands | "Refresh" |
| | File paths | "Documentation\ Manual.pdf" |
| | File names | "Readme.html" |
| Blue lettering | Internet address | www.avm.de/en |
| Pointed brackets | Variables | ‹CD-ROM drive› |
| Typewriter font | Information to be typed in using the keyboard | `a:\setup` |
| Gray italics | Tips, instructions and warnings | *...for more information, see...* |

### The Telephone Keypad

| | |
|---|---|
| ❶...❾ | Numeric keys |
| ✱ | Asterisk key |
| ⓡ | Hold or Flash key |
| ⌗ | Pound sign key |

### Instructions for Operation at the Telephone

| | |
|---|---|
| ⊞ | Dial a number. |
| ☎ | Pick up the handset. |
| ☎ | Hang up the handset. |
| ♪ | Talk. |
| ☌ | Three-party Conference Call |
| ⊙ | Wait for the acknowledgement tone. |
| ☏ | You hear the ring tone. |
| Ext. | Enter an extension number (Ext.). In the place of the abbreviation "Ext." used here, enter the number "1", "2", or a higher number, corresponding to the extension you would like to configure. |
| MSN | Enter an ISDN number (MSN). In place of the abbreviation "MSN" used here, enter the complete MSN desired, without any dialing prefix. |
| XNo./Ext. | Enter the external number (XNo.) or extension number (Ext.) to which your calls are to be diverted. In the place of the abbreviation "XNo.", enter the complete number of the external line. |
| XNo. | Dial a number. |

### Icons Designating the Functions and Features

| | |
|---|---|
| **ISDN analog VoIP** | The functions and features can be used for analog and ISDN fixed-line connections as well as for Internet telephony (VoIP). |
| **ISDN analog** | The functions and features can be used for analog and ISDN fixed-line connections. |
| **ISDN** | The functions and features can be used only for ISDN fixed-line connections. |
| **analog** | The functions and features can be used only for analog fixed-line connections. |

### Safety Instructions

When working with FRITZ!Box, follow the instructions below to protect yourself and the FRITZ!Box from injury.

Do not install the FRITZ!Box during an electrical storm.

Disconnect FRITZ!Box from the power supply during electrical storms.

Never let liquids get inside the FRITZ!Box. Otherwise, electric shocks or short circuits may result.

The FRITZ!Box is intended for indoor use only.

Do not open the FRITZ!Box housing. The device contains hazardous components and should only be opened by authorized repair technicians.

### Disposal Instructions

In accordance with the Electrical and Electronic Equipment Act, the FRITZ!Box Fon WLAN 7170, power supply plug, adapter, and cable may not be disposed with household waste. Please bring these to your local collection points for disposal.

# 1 This Is FRITZ!Box Fon WLAN 7170
## An Overview

FRITZ!Box Fon WLAN 7170 is a Private Branch Exchange (PBX) for making telephone calls via the Internet and the fixed-line network. FRITZ!Box Fon WLAN connects one or more computers directly with your DSL line. Each connected computer can establish an Internet connection over the FRITZ!Box. As a WLAN access point, FRITZ!Box offers you the possibility of connecting your computer to the DSL line wirelessly.
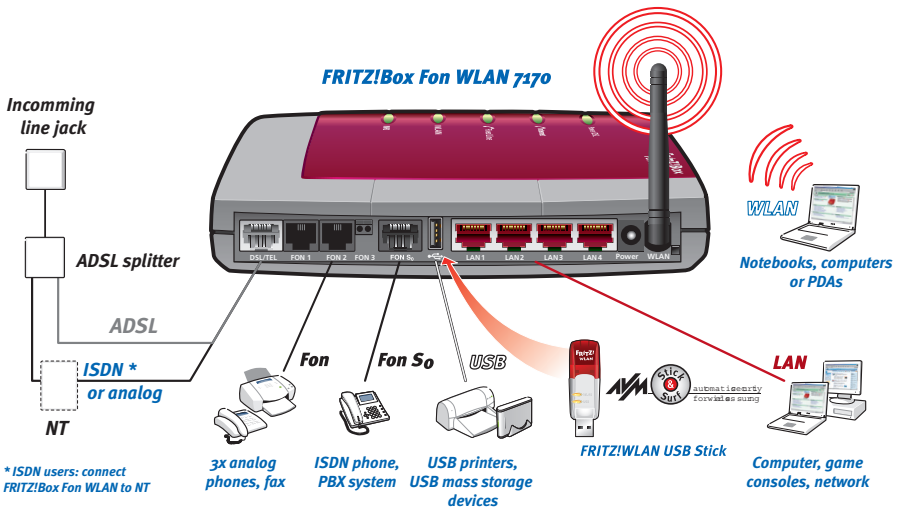


Possibilities for connecting FRITZ!Box

**PBX**    FRITZ!Box is a PBX for the connection of analog and ISDN terminal devices. You can connect two analog telephones directly, and connect any existing cabling at your location, for instance, an additional telephone jack installed in the attic story, to the FRITZ!Box. Up to eight ISDN telephony devices can be connected to the integrated ISDN $S_O$ port. You can make telephone calls using the Internet, ISDN, or the analog fixed-line network using all of the connected telephones.

**Connecting Computers**    Four computers can be connected directly to the FRITZ!Box using the four LAN ports. Using WLAN you can connect multiple computers with FRITZ!Box wirelessly.

You can also connect a network hub or switch to the LAN ports so that even more computers can be connected to FRITZ!Box.

All computers connected to FRITZ!Box are networked together and can access shared files and printers.

**Internet Connection**

All of the computers connected to FRITZ!Box can access the Internet. There are two different ways of establishing an Internet connection. Both cases require Internet account information from an Internet Service Provider:

The Internet connection is established by FRITZ!Box. For this the Internet account information must be registered in FRITZ!Box. In this case FRITZ!Box works as a DSL router and all computers can use the Internet connection at the same time.

The computers connected establish the Internet connections themselves. For this, Internet access software must be installed and the Internet account information entered on the given computer. In this case FRITZ!Box works as a DSL modem.

**Integrated Firewall**

When FRITZ!Box is operated as a DSL router, the integrated firewall protects your network from attacks from the Internet.

**USB Port**

The FRITZ!Box is equipped with a USB host controller to which you can connect a USB storage device (hard drive, stick), a printer, a AVM FRITZ!WLAN USB Stick or a USB hub. AVM Stick & Surf technology is provided by the AVM FRITZ!WLAN USB Stick. This technology allows security settings to be read from the FRITZ!Box automatically. For connecting a printer, FRITZ!Box has a printer server.

**Port for Network Devices**

Network devices can be connected to the FRITZ!Box LAN port along with network hubs or switches, including game consoles.

**WLAN Access Point**

The FRITZ!Box is a WLAN access point. Computers equipped with a WLAN adapter can be wirelessly connected to FRITZ!Box.

**Operating Systems Supported**

FRITZ!Box can be connected to computers with Windows operating systems, the Linux operating system or Apple computers with the Mac OS X operating system.

## 1.1    Package Contents

The following is included in the FRITZ!Box Fon WLAN 7170 package:

FRITZ!Box Fon WLAN 7170

one AC power adapter with cable for connection to the power mains

one 4.25-m combined DSL-telephone cable (gray/black) for connecting FRITZ!Box to the DSL splitter and the IS-DN network terminator (NT) or the analog telephone line

one network cable (red) for connecting FRITZ!Box to a computer or network hub

one RJ45-RJ11 adapter (gray) for the DSL line (required in some countries)

one RJ45-RJ11 adapter (black) for connecting FRITZ!Box Fon WLAN 7170 to the analog telephone network

one FRITZ!Box CD with

– Installation Help

– DSL software FRITZ!DSL

– software for the printer port

– documentation for all enclosed AVM components

printed quick guide

## 1.2 Operation Requirements

In order to operate FRITZ!Box, you must have the following:

a web browser that supports Java Script (for instance, Internet Explorer from version 6.0 or Netscape 4.0)

a DSL line: Standard ITU G.992.1 Annex A or B (depending on the FRITZ!Box Fon WLAN 7170 model)

for fixed-line telephony: an ISDN point-to-multipoint line in accordance with the Euro ISDN protocol DSS1, or an analog telephone line

If you would like to connect the FRITZ!Box via the LAN port of the computer, you need a computer with a network adapter (standard Ethernet 10/100 Base-T).

If you would like to connect FRITZ!Box wirelessly using WLAN, you will need a computer equipped with a WLAN adapter (in accordance with IEEE8 02.11b or IEEE 802.11g), for instance, a AVM FRITZ!WLAN USB Stick.

To install the DSL software FRITZ!DSL, the minimum computer requirements are:

– 300 MHz Pentium II processor with Windows XP or Windows 2000 and CD drive

– 32 MB RAM

– 20 MB free memory on the hard drive

# 2 FRITZ!Box: Connecting

This chapter contains instructions on the following topics:

launching FRITZ!Box operation: recommended procedure

mounting the FRITZ!Box and connecting it to the power supply

connecting one or several computers to FRITZ!Box

connecting FRITZ!Box to DSL and ISDN or the analog telephone line

connecting analog terminal devices to the FRITZ!Box

connecting ISDN terminal devices to the FRITZ!Box

## 2.1 Launching FRITZ!Box Operation

We recommend using the Installation Help on the FRITZ!Box CD when launching operation of the FRITZ!Box for the first time.

### Using the Installation Help on the CD

On computers with Windows operating systems you can use the Installation Help on the FRITZ!Box CD. The Installation Help presents instructions on the screen, guiding you through the steps required to launch operation of the FRITZ!Box.

Insert the FRITZ!Box CD in the CD-ROM drive of your computer.

The Installation Help starts automatically.

Follow the instructions in the Installation Help to prepare the FRITZ!Box for operation.

## Launching Operation without the Installation Help CD

If you do not want to use the Installation Help on the CD, then work through the instructions below in the recommended order:

1. Mounting FRITZ!Box; see the section "Mounting FRITZ!Box" from page 16.

2. Connecting FRITZ!Box to the power supply; see the section "Connecting to the Power Supply" on page 16.

3. Connecting FRITZ!Box to the computer(s); see the section "Connecting the Computer(s)" on page 17.

4. Connecting FRITZ!Box to DSL; see the section "Connecting to the DSL Line" on page 23.

5. If you want to make telephone calls with the fixed-line network using the FRITZ!Box: connect the FRITZ!Box to the fixed-line network

   – If you want to use the ISDN fixed-line network, connect the FRITZ!Box to the ISDN NT. See the section "Connecting to the ISDN Line" on page 24.

   – If you want to use the analog fixed-line network, then connect the FRITZ!Box Fon WLAN to the analog telephone jack. See the section "Connecting with the Analog Telephone Line" on page 25.

6. If you want to make telephone calls via the Internet and/or the fixed-line network using the FRITZ!Box: connect your analog equipment to the FRITZ!Box; see the section "Connecting Telephone, Fax, Answering Machine" from page 26.

7. If you want to connect an ISDN telephone or an ISDN PBX to the FRITZ!Box: connect your ISDN equipment; see the sections "Connecting ISDN Telephones" on page 28 and "Connecting an ISDN PBX" on page 28.

## 2.2    Mounting FRITZ!Box

You can either place FRITZ!Box on a horizontal surface or mount it on a wall. Please note the following:

Place or hang the FRITZ!Box in a dry location that is free of dust and protected from direct sunlight.

Do not place FRITZ!Box on excessively heat-sensitive surfaces, as the base of the device can heat up during normal operation.

When connecting FRITZ!Box to your computer using the network or USB cable, remember to take the length of the cable into account.

If you would like to establish wireless connections between FRITZ!Box and the computer, position the device at a central location.

Make sure to keep sufficient distance from potential interference sources like microwave devices or electric devices with large metal housings.

## 2.3    Connecting to the Power Supply
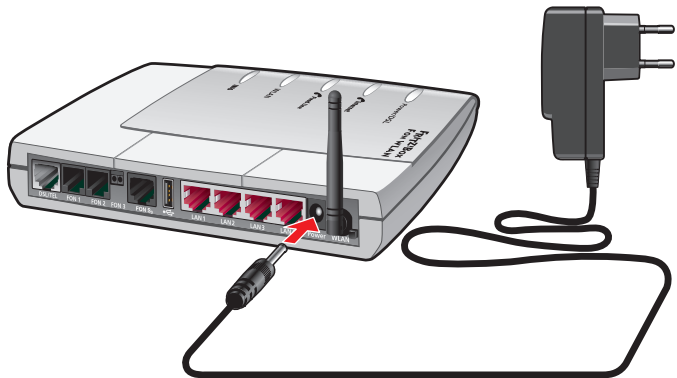


Connecting to the power supply

Connect the FRITZ!Box to the power supply as described below:

Power Supply Unit    Remove the power supply unit from the FRITZ!Box package.

Connecting

1. Connect the power mains adapter to the socket labeled "Power", located at the far right of the back panel of FRITZ!Box.

2. Plug the other end into an AC power outlet.

The green "Power/DSL" LED will begin flashing after a few seconds to indicate that the FRITZ!Box is ready for operation.

## 2.4    Connecting the Computer(s)

If you would like to surf the web using the FRITZ!Box or to open the FRITZ!Box user interface, then you must connect a computer with the FRITZ!Box.

A computer can be connected with the FRITZ!Box Fon WLAN in two different ways:

using a LAN port of the FRITZ!Box

wirelessly via WLAN

**One** computer can be connected to FRITZ!Box by only **one** of these means.

One computer can be connected to each of the four LAN ports of FRITZ!Box, and several computers can be connected with FRITZ!Box at the same time via WLAN.

The way a computer is connected to the FRITZ!Box is the same regardless of the operating system on the computer.

All of the computers connected with the FRITZ!Box constitute a network.

## 2.5    Connecting Computer(s) to a LAN Port

If you want to connect a computer to one of the four LAN ports on the FRITZ!Box, make sure that your computer is equipped with a network adapter. A LAN port is usually designated by the icon at left or labeled "LAN".
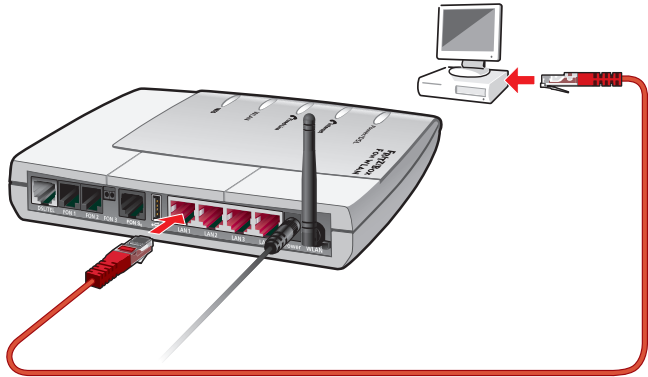


Connecting a computer to a LAN port on the FRITZ!Box

**Cable**     A red network cable for connecting a computer is included in the FRITZ!Box package.

**Connecting**   1.   Remove the network cable from the package.

2.   Switch on your computer.

   If you work with a Linux operating system, use YaST to configure your network card with the setting "DHCP", if this setting is not already configured.

3.   Insert one end of the LAN cable to the computer's network adapter.

4.   Connect the other end of the LAN cable to a socket on the FRITZ!Box labeled "LAN 1", "LAN 2", "LAN 3" or "LAN 4".

## Connecting More Computers to the LAN Ports

Additional cables are required to connect further computers. In purchasing a LAN cable, note the instructions in the section "Cables and Sockets" from page 134.

You can connect a computer to any of the four LAN ports of the FRITZ!Box at any time.

## Connecting to a Network Hub or Network Switch to the LAN Port

You can connect a network hub or switch to the LAN port if you would like to connect multiple computers to the FRITZ!Box via LAN.
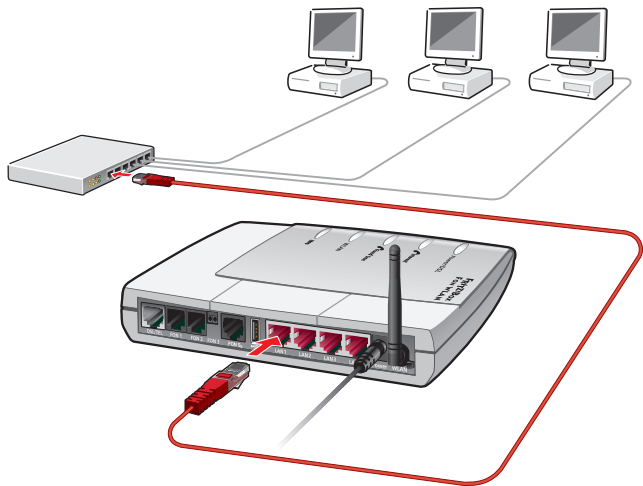


Connecting FRITZ!Box to a network hub

1.  Connect one end of the red LAN cable to the uplink port of the network hub or switch.

2.  Connect the other end of the network cable to one of the sockets on FRITZ!Box labeled "LAN".

## 2.6 Connecting to a Computer Wirelessly via WLAN

The FRITZ!Box can be connected to a computer wirelessly using WLAN.

The wireless WLAN connection is identical for all operating systems. Each computer to be connected to FRITZ!Box via WLAN must support WLAN, by means of a compatible WLAN adapter, for instance the AVM FRITZ!WLAN USB Stick.

For more information on WLAN, see the section "More about WLAN" from page 57.

### Presettings in FRITZ!Box

The FRITZ!Box is delivered with preset values for WLAN security. These values must also be entered on the computer with the WLAN adapter in order to be able to establish a successful WLAN connection.

The following values are configured in the FRITZ!Box factory settings:

| Setting | Preset Value |
| --- | --- |
| SSID (name of the WLAN radio network) | FRITZ!Box Fon WLAN 7170 |
| Encryption methods | TKIP (WPA) |
| Encryption | WPA PSK |
| Key | The key is printed on the stickers on the base of the device and on the cover of the FRITZ!Box CD. |
| Network Mode | Infrastructure |
| Channel | 6 |

### Connecting to the AVM FRITZ!WLAN USB Stick

If your are using a AVM FRITZ!WLAN USB Stick as a WLAN adapter, you can transmit the security settings conveniently with Stick & Surf. Proceed as follows:

1. Insert the AVM FRITZ!WLAN USB Stick in the USB port on the FRITZ!Box. The "INFO" LED on the FRITZ!Box begins flashing rapidly. The WLAN security settings are being transferred to the AVM FRITZ!WLAN USB Stick.

2. As soon as the "INFO" LED stops flashing, transmission of the settings has been concluded. Remove the stick.

3. Now insert the AVM FRITZ!WLAN USB Stick in the USB port of the computer.

The security settings saved on the stick are applied to the computer. A WLAN connection between the computer and the FRITZ!Box is established automatically.

See the AVM FRITZ!WLAN USB Stick manual for details.

### Connecting Using a WLAN Adapter from Another Manufacturer

1. Switch on your computer.

2. Install the WLAN adapter in your computer along with the appropriate software. Please take note of the instructions in the documentation of the adapter.

Once installation has been completed, you generally have a user interface available to control your WLAN connections. In the Windows operating systems you can open the user interface by clicking an icon in the taskbar (specific to each manufacturer) or from the start menu.

In order to establish a WLAN connection to the FRITZ!Box, you must either use the WLAN software supplied with the operating system or the manufacturer's WLAN software included in the WLAN adapter package.

## Establishing a WLAN Connection with the WLAN Software Provided by the Manufacturer

The FRITZ!Box is delivered with preset values for WLAN security. You must enter these values during the configuration of the WLAN adapter.

If you would like to establish a WLAN connection using these preset values, then your WLAN adapter must support the WPA encryption procedure.

1. Start the WLAN software.

2. Enter the followign values for the connection between the FRITZ!Box and the WLAN adpater:

| | |
|---|---|
| SSID (name of the WLAN radio network) | FRITZ!Box Fon WLAN 7170 |
| Encryption methods | TKIP (WPA) |
| Encryption | WPA PSK |
| Key | The key is printed on the sticker on the base of the device and on the cover of the FRITZ!Box CD. |
| Network mode | Infrastructure |
| Channel | 6 |

3. Confirm your entries using the relevant button in the user interface (for instance, "OK", "Send", "Submit" or "Connect").

4. Now read the information in section "Opening the User Interface" from page 30 and follow the security instructions in the section "Security" from page 59.

### If the WLAN Adapter Does Not Support the WPA Mechanism

If your WLAN adapter does not support WPA, you must change the WLAN settings in the FRITZ!Box. To do so, proceed as follows:

1. Connect the FRITZ!Box and the computer using the network cable (see the section "Connecting Computer(s) to a LAN Port" on page 18).

2.  Open the FRITZ!Box user interface (see the section "Opening the User Interface" from page 30).

3.  In the "WLAN / WLAN Security" menu, select WEP encryption and enter a network key.

4.  Click the "Apply" button.

5.  A window is displayed with the WLAN security settings. Print out the page by clicking "Print Page".

6.  Close the user interface and clear the connection between the FRITZ!Box and the computer. Remove the network cable.

## 2.7    Connecting to the DSL Line
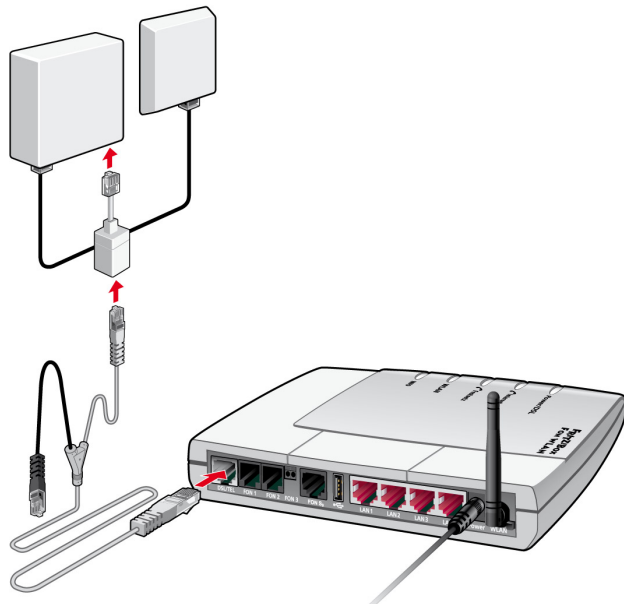


Connecting to the DSL splitter

Cable    The gray and black Y-shaped cable is for connecting to the DSL splitter. This cable is a combination of a DSL cable and a telephone cable.
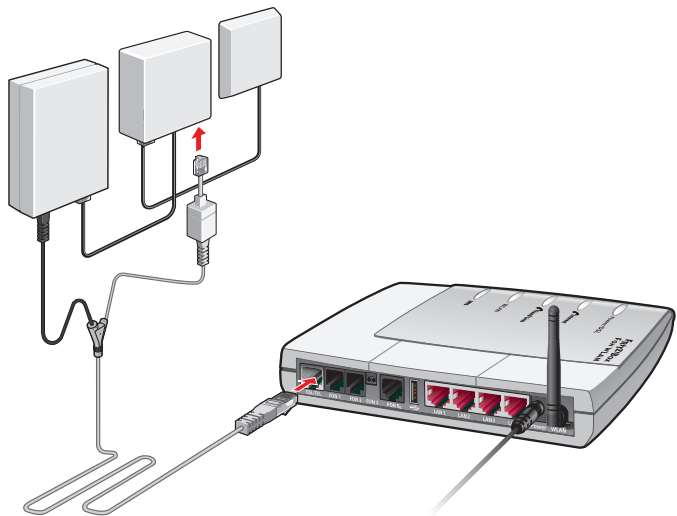
Connecting

1.  Connect the longer of the two gray branches of the cable to the socket labeled "DSL/TEL", located at the far left of the back panel of the FRITZ!Box.

2.  Then connect the other end of the cable to the socket on the DSL splitter labeled "DSL". If the end of the cable does not fit into the socket on the splitter, insert the end of the cable into the gray RJ45-RJ11 adapter included in the package and then insert the adapter into the socket on the DSL splitter.

    The black branch of the cable is for the fixed-network telephone line (see the section "Connecting to the ISDN Line" on page 24 or the section "Connecting with the Analog Telephone Line" on page 25).

The green "Power" LED stops flashing after a short time and remains lit to signalize that FRITZ!Box is ready for Internet connections over DSL.

## 2.8 Connecting to the ISDN Line

You only have to connect the FRITZ!Box with the ISDN line if you have an ISDN line and want to use the FRITZ!Box for ISDN fixed-line telephony.
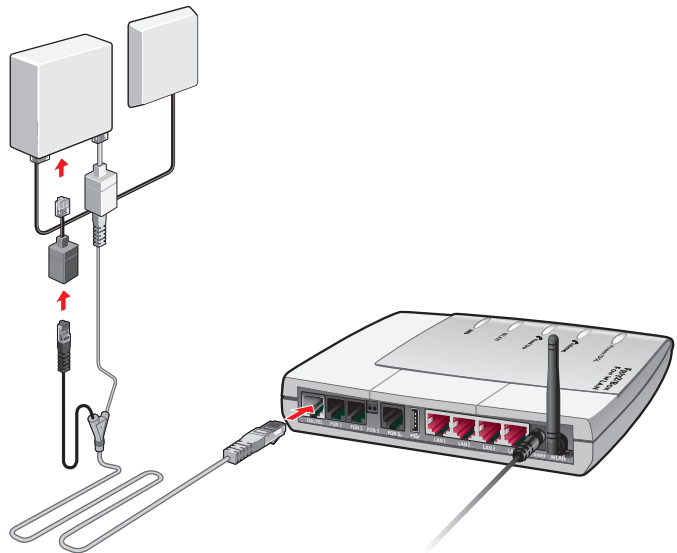


Connecting to the ISDN NT

Cable   The gray and black Y-shaped cable is for connecting to the ISDN line. This cable is a combination of a DSL cable and a telephone cable.

Connecting   1.   Connect the longer, gray end of the cable to the socket labeled "DSL/TEL", located at the far left of the back panel of the FRITZ!Box.

2.   Insert the black end of the Y-branch of the cable into the socket of your ISDN NT. If the end of the cable does not fit into the socket on the splitter, insert the end of the cable into the gray RJ45-RJ11 adapter included in the package and then insert the adapter into the socket of the ISDN-NTBA.

## 2.9   Connecting with the Analog Telephone Line

You only have to connect the FRITZ!Box with the analog line if you have an analog line and want to use the FRITZ!Box for analog fixed-line telephony.



Connecting to the analog telephone line via the DSL splitter

Cable   The gray and black Y-shaped cable is for connecting to the ISDN line. This cable is a combination of a DSL cable and a telephone cable.

Connecting    1.  Connect the longer, gray end of the cable to the socket labeled "DSL/TEL", located at the far left of the back panel of the FRITZ!Box.

2.  Then insert the black plug into the appropriate jack of your DSL splitter. If the plug does not fit into the splitter, connect the end of the cable to the black RJ45-RJ11 adapter included in the package and then insert the adapter into the socket on the DSL splitter.

## 2.10  Connecting Telephone, Fax, Answering Machine

Connect your analog equipment to the FRITZ!Box so that you can make telephone calls and fax using the Internet or the fixed-line network.

Prerequisites:   If you would like to use your fixed line to make telephone calls or fax, note the following requirements:

| For fixed-line telephony via ISDN you must connect the FRITZ!Box with the ISDN NT (see the section "Connecting to the ISDN Line" on page 24). |
| --- |
| In order to use the analog fixed-line network, the FRITZ!Box must be connected with the analog fixed line (see the section "Connecting to the ISDN Line" on page 24). |

### Connecting to an Analog Telephone

The ports "FON 1", "FON 2" and "FON 3" on the FRITZ!Box are available for connecting your analog terminal equipment.

Use **"FON 1"** and **"FON 2"** to connect your analog equipment directly to the FRITZ!Box.

**"FON 3"** serves to connect analog terminal equipment that is located further away to the FRITZ!Box, for instance an additional telephone jack on a higher floor, using the wiring at your location.
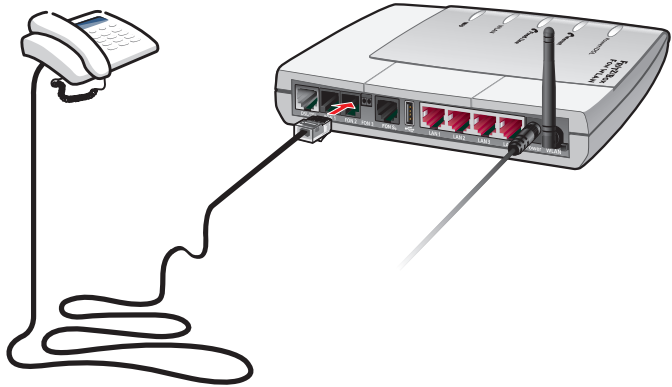
Connecting an analog telephone to FRITZ!Box

### Connecting to "FON 1" or "FON 2"

To connect analog terminal devices like a telephone, fax device or answering machine, insert the plugs of your analog devices into the "FON1" or "FON2" socket on FRITZ!Box.

### Connecting to "FON 3"

To connect analog devices located further away to the FRITZ!Box, connect the cables of the telephone jack that has been led through (the wiring at your location) to the cable clips. Please note the following:

> The wire must be 0.5 to 1 mm in diameter.

> Strip the insulation from the wire to expose a length of 10 mm.

To connect a cable, press back the orange lever, insert a wire and release the lever. Repeat the procedure with the second wire of the cable.

## 2.11 Connecting ISDN Telephones

If you have an ISDN telephone, you can connect this telephone to the FRITZ!Box and use it to make calls via the Internet and the fixed-line network. With appropriate cabling, up to eight ISDN telephones can be connected.
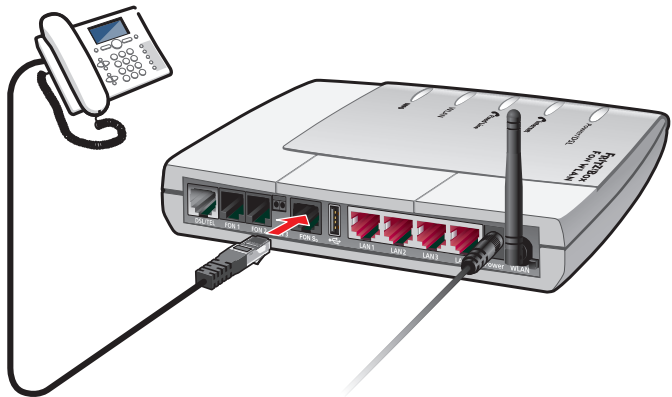


Connecting an ISDN telephone to the FRITZ!Box

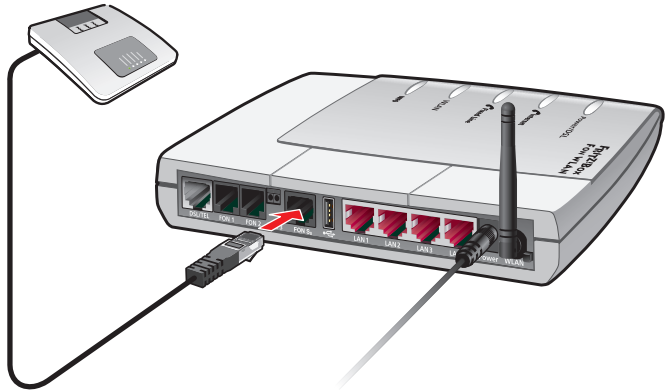Cable     Connect an ISDN telephone using an ISDN cable.

Connecting

1. Connect one end of the ISDN cable with the ISDN telephone.

2. Connect the other end of the ISDN cable with the "FON S$_0$" port of the FRITZ!Box.

## 2.12 Connecting an ISDN PBX

If you have an ISDN PBX, you can connect this PBX to the FRITZ!Box Fon WLAN. With the telephones connected to the PBX you can make calls both via the Internet and via the fixed-line network.

The ISDN PBX must support a point-to-multipoint line.

Connecting an ISDN PBX to the FRITZ!Box

Cable      Connect ISDN PBXs using an ISDN cable.

Connecting   **1.**   Connect one end of the ISDN cable with the ISDN PBX.

**2.**   Insert the other end of the ISDN cable into the socket on FRITZ!Box labeled "FON S$_o$".

If you have no more than three analog devices connected to the PBX, you can connect them directly to the FRITZ!Box and do without the PBX.

# 3   Opening the User Interface

The FRITZ!Box is equipped with a web-based interface. This is where you configure the settings for operating the FRITZ!Box. This interface can be accessed from any of the computers connected with FRITZ!Box. The settings are saved in FRITZ!Box.

There are two ways to open the FRITZ!Box user interface:

with the FRITZ!DSL software

Install the FRITZ!DSL software included in the FRITZ!Box package on your computer, and open the FRITZ!Box user interface from the FRITZ!DSL Start Center. For more information about FRITZ!DSL, see the chapter "FRITZ!DSL: The Software Suite" from page 53.

with a web browser

Open your Internet browser on the computer and enter `fritz.box`.
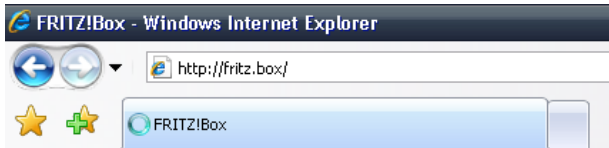


The "fritz.box" address entry in the address field of an Internet browser

When the FRITZ!Box user interface is started, FRITZ!Box is ready for operation.

The FRITZ!Box user interface has several pages, each of which can be accessed directly by clicking the menu command on the left edge.

If the user interface does not open, see the instructions in the section "Errors Opening the User Interface" from page 80.

See the section "Configuring Internet Connections" from page 31 for instructions on configuring Internet connections for the FRITZ!Box.

# 4 Configuring Internet Connections

The Internet access is set up in the FRITZ!Box user interface.

Internet access for the FRITZ!Box can be made available via two different connection types:

Internet connection via DSL

With this kind of connection the FRITZ!Box can be operated as a DSL router. In this case the DSL connection is established by the FRITZ!Box, and registration at the Internet Service Provider is also taken care of by the FRITZ!Box.

Internet connection via LAN 1 / WAN

The FRITZ!Box must be connected to an existing system via a network, as a cable modem, or as a DSL router (see the connection instructions).

For this connection type the FRITZ!Box can be connected with an already existing Internet connection via the local network, an existing DSL router or a similar means. In this case the FRITZ!Box is operated either as an NAT router for the connected computers, or as an IP client in the network that shares the existing Internet connection. Then the LAN 1 port functions as an uplink or WAN port.

The following section presents instructions for configuring Internet access for both types of connection.

The Internet access is configured by setting up the FRITZ!Box for the selected connection type and operation mode and defining the connection settings. If necessary, enter the account information provided by your Internet Service Provider.

## 4.1 Configuring Internet Access for a Direct DSL Connection

See also the Help available in the user interface for assistance in configuring the Internet access.

**Using the Configuration Wizard**

If you have connected the FRITZ!Box directly at the DSL port and have account data from an Internet Service Provider at your disposal, you can use the Configuration Wizard available in the user interface. With the Configuration Wizard all of the necessary basic settings are performed in just a few steps.

**Manual Configuration**

If you would like to configure the Internet access without the assistance of the Configuration Wizard, proceed as follows:

Keep the Internet access information you received from your Internet Service Provider handy.

1. Start a web browser.

2. Enter `fritz.box` in the address field.

3. Select the "Settings" menu.

4. Select the the "Account Information" command from the "Internet" menu.

5. Select the connection type "Internet connection via DSL" in the "Connection" area.

6. In the "Operating Mode" area, select the "Use one Internet connection for all computers (router)" setting.

7. Your Internet access is defined either by means of account data (user name and password) or in accordance with RFC 1483/RFC 2684.

   – If you require a user name and password for Internet access, select the setting "Account information required (PPPoE/PPPoA connection)".

   – If your DSL Internet access does not require any account information, because the connection is established via DHCP or static IP address (transparent bridging/bridged ethernet in accordance with

RFC 1483/RFC 2684), select the setting "No account information required (in accordance with RFC 1483/RFC 2684)".

8. Enter the Internet account information you received from your Internet Service Provider in the "Connection Settings" area.

9. Click the "Apply" button to transmit your entries to the FRITZ!Box.

Now your Internet access is configured and all connected computers can use this Internet connection at the same time.

## 4.2  Configuring Internet Access for a Connection to an Existing Network

If you connected the FRITZ!Box to an already existing network (LAN), a cable modem or a DSL router, proceed as follows to configure Internet access:

1. Start a web browser.

2. Enter `fritz.box` in the address field.

3. Select the "Settings" menu.

4. Select the the "Account Information" command from the "Internet" menu.

5. Select the connection type "Internet Connection via LAN 1" in the "Connection" area.

Two different operating modes are possible for this kind of connection. The following section presents separate instructions on how to proceed for each of these operating modes.

### Operating Mode "Establish own Internet connection (NAT router with PPPoE or IP)"

In this operating mode the Internet connection is established by the FRITZ!Box and made available to all connected network devices.

1.  In the "Operating Mode" area, select the setting "Establish own Internet connection (NAT router with PPPoE or IP)".

2.  You access the Internet either via account data (user name and password) or via the IP address.

    –   If your Internet access requires account information, select the setting "Account information required (PPPoE/PPPoA connection)".

    –   If your Internet access takes place via the IP address, select the "No account information required (IP)" setting.

3.  Enter the Internet account information you received from your Internet Service Provider in the "Connection Settings" area.

4.  Click the "Apply" button to transmit your entries to the FRITZ!Box.

Operating Mode "Share existing Internet connection in the network (IP Client)"

1.  In the "Operating Mode" area, select the setting "Share existing Internet connection in the network (IP Client)".

2.  Configure the IP settings.

3.  Configure the speed of your DSL line.

4.  Click the "Apply" button to transmit your entries to the FRITZ!Box.

# 5  Configuring FRITZ!Box for Telephone Connections

This chapter describes how to set up FRITZ!Box for fixed-line and Internet telephony. The following steps are necessary:

Entering account information and Internet numbers for Internet telephony

Entering numbers for calls over fixed lines

Configuring connected analog terminal devices, ISDN telephones or ISDN PBXs at FRITZ!Box

Information on the following topics is also presented here:

Dialing rules for Internet and fixed-line telephony

How does Internet telephony work with FRITZ!Box?

## 5.1  Entering Account Information and Internet Numbers for Internet Telephony

If you configured the Internet connection and Internet telephony using the FRITZ!Box Configuration Wizard, the required data are already entered.

If you would like calls from the Internet to be able to reach you at all times, then disable the option "Hang up after... seconds" on the "Internet / Account Information" page.

### Configuring Additional Internet Numbers

You can set up additional Internet numbers in FRITZ!Box Fon WLAN. To do this you will need the corresponding account information from your Internet telephony provider.

Proceed as follows to set up an additional Internet number:

1.  Start a web browser.

2.  Enter `fritz.box` in the address field.

3.  Select the "Settings" menu.

4.  Click the "Internet Telephony" command in the "Telephony" menu.

5.  Click the **"New Internet Number"** button.

6.	Enter the account information you received from your Internet telephony provider in the appropriate fields.

7.	Click the "Apply" button.

The new number is added to the list of Internet numbers.

## 5.2	Entering Numbers for Calls over Fixed Lines

For fixed-line telephony your fixed-line numbers must be configured in the FRITZ!Box. Proceed as follows:

1.	Start a web browser.

2.	Enter `fritz.box` in the address field.

3.	Select the "Settings" menu.

4.	Click the "Extensions" command in the "Telephony" menu.

5.	Select the "Fixed-line Numbers" page.

6.	Specify whether your fixed line is an ISDN line or an analog line.

7.	Enter the ISDN numbers (MSNs) or the analog number in the corresponding fields.

8.	Click the "Apply" button.

## 5.3	Configuring Analog Equipment

FRITZ!Box is configured so that you can make calls to the analog network immediately after connecting analog terminal devices, without any additional settings required.

The following settings are preconfigured at the analog lines "FON 1", "FON 2" and "FON 3":

calls can be accepted on all three lines: connected terminal devices will ring at the same time

outgoing calls can be conducted on all three lines

If the connected terminal devices are to react only to certain numbers, numbers must be assigned to the extensions. The number defined as "Number of the extension" also defines whether calls from this extension will be conducted using the fixed-line network or the Internet.

To do this, perform the following steps:

1. Start a web browser.

2. Enter `fritz.box` in the address field.

3. Select the "Settings" menu.

4. Click the "Extensions" command in the "Telephony" menu.

5. On the "Overview" page, click the button next to the number of the extension to change its properties.

6. If the terminal equipment is to react only to the specified number, remove the checkmark from the checkbox "React to all numbers".

7. Select the desired number from the "Number of the extension drop-down menu".

   The device connected to the "FON 1" extension reacts to incoming calls placed to this number and uses the kind of connection specified for outgoing connections with this number.

8. If you would like to assign additional numbers to the extension, select from the "Additional numbers" drop-down menus any other numbers the device at the "FON 1" line should react to for incoming calls.

9. Click the "Apply" button.

10. If desired, set up the "Extension FON 2" and the "Extension FON 3" in the same manner.

## 5.4    Configuring ISDN Telephones

Up to eight ISDN phones can be connected to the FRITZ!Box. Connect the ISDN telephones to the ISDN $S_0$ port "FON $S_0$".

The following ISDN services are supported for Internet telephony:
voice, telephony, audio 3.1 and fax G2/G3.

All other ISDN features are supported on the ISDN line. Outgoing connections with these ISDN service indicators are automatically routed via the ISDN line.

### Assigning Internet and Fixed-Line Numbers to ISDN Telephones

If the connected ISDN telephones should only react to certain numbers, MSNs must be configured in the ISDN telephones.

Proceed as follows to specify whether calls are conducted on the fixed-line network or over the Internet:

**No MSNs Are Configured in the ISDN Telephone**

If no MSNs are configured in the ISDN telephone, the main phone number is used for outgoing calls. The main number is listed in the "Telephony / ISDN Terminal Devices" menu.

If the main number is a fixed line, all calls will be conducted on the fixed-line network.

If the main number is an Internet number, all calls will be conducted over the Internet.

**MSNs Are Configured in the ISDN Telephone**

If you specify an Internet number as the outgoing MSN in the ISDN telephone, outgoing calls will be conducted over the Internet.
Internet numbers can be set up in the ISDN phone just like MSNs.

If you have entered only fixed-line numbers as MSNs in the ISDN telephone, all calls will be conducted on the fixed-line network. If you want to use Internet telephony, you must replace an MSN with an Internet number.

See the documentation for your ISDN telephone for instructions on setting up MSNs.

In FRITZ!Box you can enter additional Internet or fixed-line numbers, which can then be assigned to the ISDN telephones. A list of all registered numbers is displayed after selecting "Telephony / ISDN Terminal Devices" in the menu.

All of the MSNs set up in the ISDN terminal devices must also be entered in FRITZ!Box.

## 5.5    ISDN PBXs on FRITZ!Box

ISDN PBXs can be connected to the ISDN $S_o$ port "FON $S_o$" of the FRITZ!Box.

The following ISDN services are supported for Internet telephony:
voice, telephony, audio 3.1 and fax G2/G3.

All other ISDN features are supported on the ISDN line. Outgoing connections with these ISDN service indicators are automatically routed via the ISDN line.

When PBXs are connected, only the ISDN BRI (basic rate interface) is supported.

1.    If not all of your MSNs have been configured in the PBX, enter your MSNs now. The MSNs must match the numbers registered in the FRITZ!Box. In the "Telephony / ISDN Devices" menu, all of the numbers registered in the FRITZ!Box are displayed in the "Existing Numbers" list.

2.   If you want to use Internet telephony, the Internet numbers must be set up in the ISDN PBX. The Internet numbers are then assigned to the extensions of the PBX as outgoing numbers.

See the documentation for your ISDN PBX for instructions on setting up MSNs.

## 5.6   Dialing Rules for Internet and Fixed-Line Telephony

Dialing rules specify when calls are conducted on the fixed-line network, and when they take place over the Internet.

1.   Start a web browser.

2.   Enter `fritz.box` in the address field.

3.   Select the "Settings" menu.

4.   Click the "Dialing Rules" command in the "Telephony" menu.

5.   On the "Dialing Rules" page you can define the kind of connection for ranges of numbers.

All connections to number ranges for which a dialing rule has been defined are established using the specified connection type.

6.   Click the "New Dialing Rule" button to define as many dialing rules as desired.

7.   Click the "Apply" button.

## 5.7 Selecting the Type of Connection Manually

If you would like to use a certain kind of connection (Internet or fixed-line) for one call, dial the following keys on the telephone keypad **before the number**:

**Fixed-line Connections**

| ✱❶❶❶# | establishes a fixed-line connection |
|---|---|

**Internet Connections**

| ✱❶❷# | establishes an Internet connection. The Internet number used is the Internet number set for line 1 |
|---|---|
| ✱❶❷ P # | establishes an Internet connection for a selected Internet number. For "P", enter the position of the Internet number in the "List of Internet Numbers". |

## 5.8 How Does Internet Telephony Work?

All kinds of data transmission in the Internet use the Internet Protocol (IP). IP is packet-oriented. This means that the data are broken down into data packets for transmission and IP takes care of the transport of the individual data packets through the Internet. Language is also transmitted in the Internet in this manner.

In opposition to this, fixed-line telephony transmits data in a line-oriented manner. In this case data are transmitted in a coherent data stream.

For packet-oriented transmission in the Internet, the loss of packets cannot be ruled out completely. Under unfavorable conditions this can lead to speech quality in Internet telephony that is inferior to that in fixed-line telephony.

## Telephony Scenarios

If you have configured both a fixed-line number and an Internet number in FRITZ!Box, you can make calls in all directions:

> from the fixed-line network into the fixed-line network

> from the Internet into the fixed-line network

> from the Internet into the Internet

and receive calls from all directions as well.

## Bandwidth Management with FRITZ!Box

FRITZ!Box is equipped with integrated bandwidth management. This function ensures that the speech quality during telephone calls over the Internet is not reduced by surfing activity. FRITZ!Box adjusts all uploads and downloads to the currently available bandwidth. Because FRITZ!Box also places a higher priority on Internet telephony connections over Internet data connections, unwelcome interference is largely avoided. Just as for any other analog call, once Internet telephony transmission capacity has been reached, remote partners receive a busy sign.

# 6 USB Devices

The FRITZ!Box is equipped with a USB port (also known as a USB host controller). Various USB devices can be connected to the host controller:

a AVM FRITZ!WLAN USB Stick

a USB mass storage device (hard drive, memory stick)

a printer

a USB hub

At the USB hub you can connect two USB mass storage devices and one USB printer, or three USB mass storage devices.

## 6.1 Connecting USB Devices

Some of the USB devices, such as memory sticks or the AVM FRITZ!WLAN USB Stick, are inserted directly into the USB port of the USB host controller. Other devices like USB printers are connected to the USB host controller by means of a USB cable.
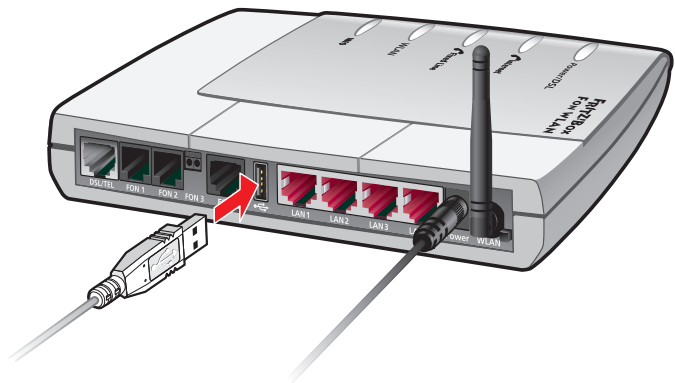


Connecting a USB cable to the USB Port

1. Insert the end of the cable with the flat plug into the USB port.

2. Insert the end of the cable with the square plug into the USB port on your USB device.

## 6.2 Accessing USB Devices

Network Access — As soon as a USB device is connected to the FRITZ!Box, all of its functions are available in the entire network:

The files in the USB mass storage can be accessed from the network via FTP (File Transfer Protocol), or you can make the USB mass storage device available as a network storage device.

USB printers are available as network printers.

## 6.3 USB Mass Storage Devices

USB mass storage devices include hard drives and memory sticks.

### File Systems Supported

For access via FTP (File Transfer Protocol), USB mass storage devices are supported using the file systems FAT and FAT32.

### Connecting USB Mass Storage Devices

A USB mass storage device can be connected either directly to the USB port or via the USB hub (see the section "USB Hub" on page 52).

### Access Rights and Password Protection

On the FRITZ!Box user interface you can configure access rights and a password to protect USB mass storage.

1. Start a web browser.

2. Enter `fritz.box` in the address field.

3. Select the "Settings" menu.

4. Select the "USB Devices / Mass Storage Device" menu.

5. Configure the access rights and password protection for the USB mass storage devices.

The access rights and password are valid for all USB mass storage devices. It is not possible to assign a different password for each individual mass storage device.

### Accessing the Data in the USB Mass Storage

USB mass storage devices connected to the FRITZ!Box directly or via a USB hub are displayed with their device name in the "USB Devices / Mass Storage Device" menu on the user interface.

**Access via FTP (File Transfer Protocol)**

All of the computers in the network can access the data in the USB mass storage simultaneously via FTP.

Click the name of the mass storage device in the "USB Devices / Mass Storage Device" menu or open a web browser and enter `FTP://fritz.box` in the address field. The folder structure of the USB storage device is displayed in the web browser.

The data in USB mass storage can be accessed via FTP using any FTP client.

Files from the USB storage device cannot be executed or opened in a suitable program until they have been copied to your computer or your local network.

**Access to USB Network Storage**

The FRITZ!Box offers you the possibility of making USB mass storage devices available in the Windows network as network drives (Samba). Files in the USB memory then can be opened and processed directly on the USB mass storage device.

Files are supported up to a size of 2 GB.

## 6.4    USB Printers

A USB printer can be connected to the USB port for use as a network printer. The printer is then available to all computers connected with the FRITZ!Box.

If you would like to connect a USB printer, please note the following:

Only printers that can be addressed with the device class "Printer" are supported as network printers. This is not the case for some multi-function devices, for instance combined fax-scanner-printers.

Host-based printers, like those that work according to the GDI system, are not supported for operation as network printers with the FRITZ!Box.

For multi-function devices (printers with additional functions like fax or scanning) operated as network printers, only the printing function is supported.

If the printer you are using as a network printer is equipped with a status monitor, you may not be able to use this.

For computers with Linux:
The printer must be supported by CUPS (Common UNIX Printing System) software and be detected correctly at the USB port of the FRITZ!Box.

For Apple computers:
The only printers that can be used are the ones whose drivers can be selected in the Printer utility or for which a compatible driver is available there.

If you want to use the printer as a network printer, the printer connection must be configured, and the suitable printer drivers installed, on every computer. Print jobs are forwarded to the IP address of the printer server in the local network via the printer port.

### Configuring the Printer Port in the Windows Operating Systems

If the "FRITZ!Box" entry is already listed in the "Programs" group of the start menu of the computer, this means that the printer port is already configured on this computer.

Otherwise, work through the following steps to create the entry in the start menu and thus configure the printer port:

1.  Insert the FRITZ!Box CD in your CD-ROM drive.

    The Installation Help for starting operation of the FRITZ!Box is started.

2.  Click the "View CD Contents" button.

3.  Click the "Start Menu Entry" button.

    The printer port designated "AVM: (FRITZ!Box USB Printer Port)" will be configured.

Now you can install the printer drivers of the printer connected to FRITZ!Box for this printer port.

### Installing Print Drivers in Windows Vista

1.  Click the "Start" button in the task bar and select the "Control Panel".

2.  Select "Printers".

3.  Click "Add Printer".

4.  Select "Add a local printer".

    You must make this selection because the printer port on the computer functions as a local port.

5.  Select the setting "Use an existing port" and then choose the entry "AVM: (FRITZ!Box USB Printer Port)" from the list. Click "Next".

6.  Select the manufacturer for the USB printer connected to the FRITZ!Box from the "Manufacturers" list and then select the exact model from the "Printers" list.

    If the manufacturer or the model is not included in the lists, use an installation disk or CD with the required files and click "Have Disk...".

7.  You can enter a name for the printer in the "Printer Name" field. The operating system will use this name to administer the printer.

8.  Conclude the installation by clicking "Finish".

## Installing Print Drivers in Windows XP/2000

1.  Open the start menu of the computer and click the "Printers and Faxes" entry (Windows XP) or click "Start / Settings / Printer" (Windows 2000).

2.  In the "Printers and Faxes" window, click "Add a printer" in the "Printer Tasks" area on the left hand side.

    The "Add Printer Wizard" will be started.

3.  Click "Next".

4.  Select the option "Local printer attached to this computer (Windows XP)" or "Local Printer" (Windows 2000) and make sure that the setting "Automatically detect and install my Plug and Play printer" is disabled.

    You must make this selection because the printer port on the computer functions as a local port.

5.  Click "Next".

6.  In the "Select a Printer Port" window, select the option "Use the following port" and select "AVM: (FRITZ!Box USB Printer Port)" from the list field. Click "Next".

7.  Select the manufacturer for the USB printer connected to the FRITZ!Box from the "Manufacturers" list and then select the exact model from the "Printers" list.

    If the manufacturer or the model is not included in the lists, use an installation disk or CD with the required files and click "Have Disk...".

8.  In the "Name Your Printer" window, answer the question "Do you want to use this printer as the default printer?" (Windows XP) or "Do you want your Windows-based programs to use this printer as the default printer?" with "No".

## Setting Up Printers in SUSE Linux Systems

You can connect a USB printer to the USB port of the FRITZ!Box for use as a network printer. The printer is then available to all computers connected with the FRITZ!Box.

### Installing a Printer

You install the printer as "superuser".

1.  Open a console and enter the following command:

    ```
    lpadmin  -p  <printer_name>  -E  -v
    socket://<IP_address_of_FRITZ!Box>  -m
    <printer_description_file.ppd>
    ```

2.  For information about the necessary settings, please refer to:

    http://www.cups.org/man/lpadmin.html

### Example

For a laser jet printer with the example name of "Laserjet4" and the PPD file "laserjet.ppd" at a FRITZ!Box with the default address 192.168.178.1, on the console you must enter:

```
lpadmin   -p   LaserJet4   -E   -v
socket://192.168.178.1 -m laserjet.ppd
```

You can view the PPD files installed in the system with the following command:

```
lpinfo -m
```

Please direct any questions about PPD files for your printer to the manufacturer of the printer or system used. More detailed information on the CUPS printing software is included in the following documentation:

http://www.cups.org/documentation.php

Configuration questions should also be directed to the manufacturer of the distribution or to an Internet-based or usenet forum that deals with CUPS or the distribution used.

## Setting Up USB Printers on Apple Computers

A USB printer can be connected to the USB port of the FRITZ!Box for use as a network printer. The printer is then available to all computers connected with the FRITZ!Box.

**Installing a Printer**

1.  Under "Go / Utilities", open the "Printer Setup Utility".

2.  Click "Add".
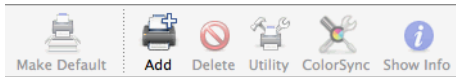


3.  Select "IP Printer".
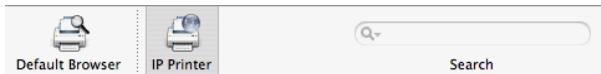


4.  In the "Protocol" field, select the entry "HP Jet Direct – Socket".
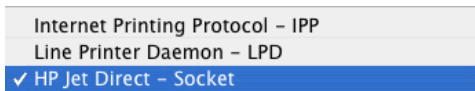


If the printer cannot be selected, it may be possible to select a compatible printer or printer driver.

5.  Enter in the "Address" field the IP address of the FRITZ!Box:

    192.168.178.1:

6.  Leave the "Queue" field empty.

7.  Enter the desired values in the "Name" and "Location" fields.

8.  Enter a driver compatible with your printer in the "Print Using" field.

9.  Click the "Add" button to save your settings.

Information about compatible printers or printer drivers is available in the Internet, for instance on the page:

http://gimp-print.sourceforge.net/p_Supported_Printers.php3

or from the printer manufacturer.

## 6.5    AVM FRITZ!WLAN USB Stick

The AVM FRITZ!WLAN USB Stick is a WLAN adapter for connection to a computer. Using this WLAN adapter you can connect the computer wirelessly with any FRITZ!Box.

**AVM Stick & Surf Technology**

With this technology it is easy to establish a secure WLAN connection.

1.    Insert the Stick in the port on your FRITZ!Box for the USB host controller.

2.    The "INFO" LED on the FRITZ!Box begins flashing rapidly. The WLAN security settings are being transferred to the AVM FRITZ!WLAN USB Stick.

3.    As soon as the "INFO" LED stops flashing, transmission of the settings has been concluded. You can now remove the stick.

After the security settings have been transmitted automatically, you can insert the AVM FRITZ!WLAN USB Stick in a computer and establish a connection to the FRITZ!Box. No manual settings are necessary.

## 6.6 USB Hub

A USB hub can be connected to the USB host controller. A USB hub is a device to extend existing USB ports.

You can connect two USB mass storage devices and one USB printer, or three USB mass storage devices (like a hard drive or memory stick) to the USB hub.

If more than one USB device without its own power supply is connected to the FRITZ!Box, please note that, in accordance with the USB specification, the total current consumption may not exceed a value of 500 mA. Otherwise unspecified malfunctions with the USB devices or even damage to the FRITZ!Box may occur.

# 7 FRITZ!DSL: The Software Suite

The FRITZ!DSL software suite is included in your FRITZ!Box package. The software includes a number of programs and tools we will introduce briefly in this chapter.

Once you have installed FRITZ!DSL, the "Start Center" icon appears on your desktop. All of the programs in the software package are integrated in the FRITZ!DSL Start Center, from where they can be started directly.

The Start Center contains the following buttons:

Click the "Internet" button to start the FRITZ!DSL Internet program. FRITZ!DSL Internet is the Internet monitoring software for your FRITZ!Box, with which you receive more detailed information about your current Internet connection.

The "Protect" button starts the FRITZ!DSL Protect program, which checks the Internet connections and supplements the firewall functions of your FRITZ!Box.

Click the "FRITZ!Box" button to open the user interface of FRITZ!Box in your web browser.

Click the "Update" button to check whether a firmware update for your FRITZ!Box is available on the AVM web site.

The "Diagnosis" button starts the FRITZ!DSL Diagnosis. It displays all data relevant to your DSL connection, and checks the installation and connection of FRITZ!Box.

Click the "Web Test" button to start the WebWatch program. WebWatch can measure the quality of your Internet connection to any remote site.

For detailed information on configuring and using FRITZ!DSL programs, see the corresponding Online Help programs.

## 7.1 Installing FRITZ!DSL

Proceed as follows:

1. Insert the FRITZ!Box CD and double-click the "Setup.exe" file.

2. Select "View CD contents / Install FRITZDSL".

3. The "File Download" window opens. Select the "Open" button in this window.

4. The FRITZ!DSL welcome screen appears. Confirm with "Continue".

5. Specify the folder in which you want to install FRITZ!DSL on your computer. Confirm with "Continue".

6. Next, specify the program group for FRITZ!DSL in the Start menu. Confirm with "Continue".

7. Confirm with "Finish".

This concludes the installation.

## 7.2 FRITZ!DSL Internet

FRITZ!DSL Internet is the Internet monitoring software for your FRITZ!Box. For instructions on how to configure the program and use it to connect to the Internet, see the corresponding Online Help.

As soon as an Internet connection has been established, FRITZ!DSL Internet presents you with information about the current Internet connection. If  is used in combination with a router, the program displays the connection status, provides information about the course of data transmissions, and allows the Internet connection of FRITZ!Box to be established or cleared from the computer.

FRITZ!Box takes care of dialing into the Internet, firewall protection from unauthorized incoming connections, and keeps track of transmission volume and online time. In addition you can also use the FRITZ!DSL program to check the outgoing Internet connections.

## 7.3    FRITZ!DSL Protect

FRITZ!DSL Protect protects your computer from unwanted Internet connections, supplementing the firewall functions of your FRITZ!Box. With FRITZ!DSL Protect you can check all Internet connections that are established or accepted by local programs on your computer. You can permit or prohibit individual programs from accepting connections. If an unknown program attempts to establish an Internet connection, you will be asked whether you wish to allow such a connection.

An overview shows the programs already set up in FRITZ!DSL Protect along with their access rights. A Journal grants you an overview of all successful and rejected attempts to access the Internet.

One of the most convenient functions offered by FRITZ!DSL Protect works in combination with the UPnP capability of the FRITZ!Box. If enable the option "Allow changes to security settings over UPnP" in the FRITZBox, FRITZ!DSL Protect can foward ports for incoming connections on the FRITZ!Box whenever they are needed by programs. For this capability you must activate the "Use port forwarding" option in the "Settings" of FRITZ!DSL Protect. In this manner you can participate in online activities like gaming without having to reconfigure the FRITZ!Box firewall functions manually.

## 7.4    FRITZ!Box

Click the "FRITZ!Box" button to open the user interface of FRITZ!Box in your web browser. In the FRITZ!Box user interface you can set up a shared Internet access for all connected computers and change the FRITZ!Box settings.

## 7.5    Update

New firmware updates for FRITZ!Box are provided by AVM at regular intervals, free of charge. The updates can add new functions to your FRITZ!Box.

Click the "Update" button to check whether there is a new update available for the FRITZ!Box firmware.

When the FRITZ!DSL Start Center is started, the AVM web site is automatically checked for new updates every 30 days. You will be informed when a new update is available.

## 7.6    FRITZ!DSL Diagnosis

FRITZ!DSL Diagnosis reports comprehensively about all of the details of the DSL connection, including data transmission and the activated fast-path mode. The integrated comprehensive DSL diagnosis makes it possible to monitor the FRITZ!Box connection and installation.

## 7.7    Web Test

Click the "Web Test" button in the FRITZ!DSL Start Center to start the  WebWatch program. WebWatch tests the quality of your Internet connection, and displays the results of these tets graphically.

Once any URL is entered, WebWatch sends a signal to the destination address.

The response times measured and the path of the data packets through the Internet are displayed in a diagram and in an overview.

# 8 More about WLAN

WLAN is a radio technology that allows Ethernet networks and access to the Internet to be provided without cable connections. This allows multiple users to share one wireless Internet connection.

## 8.1 Standards

The WLAN standards IEEE 802.11b, IEEE 802.11g and IEEE 802.11i were developed by the Institute of Electrical and Electronic Engineers (IEEE).

### Standards for the Throughput Rate

Data Throughput    The standards IEEE 802.11b and IEEE 802.11g define the transmission rate within a wireless LAN. These standards differentiate between gross and net transmission rates. The net speed describes the transmission rate of the user data. The standards are intended for different frequency bands.

| Standard | Frequency Band / Frequency Bands | Gross Data Throughput | Net Data Throughput |
|----------|----------------------------------|-----------------------|---------------------|
| 802.11b  | 2.4 GHz | 11 Mbit/s | 5 Mbit/s |
| 802.11g  | 2.4 GHz | 54 Mbit/s | 25 Mbit/s |

The FRITZ!Box supports both standards. WLAN adapters based on one or more of the standards listed can be used for WLAN connections with the FRITZ!Box.

Range    The range within a WLAN is highly dependent on the following three factors:

the WLAN adapter used,

the structural conditions

the amount of radio traffic on the same frequency band. Other WLAN networks, microwave ovens or Bluetooth transmitters (mobile telephones) may be active.

IEEE 802.11b   With a maximum throughput rate of 11 Mbit/s, this is the oldest standard for radio networks. Older WLAN adapters of the first generation can communicate with the FRITZ!Box using 802.11b. However, if the WLAN adapter supports newer standards such as 802.11g, the latest standard should be used.

IEEE 802.11g   This is currently the most common WLAN standard. It communicates with a maximum of 54 Mbit/s in the 2.4-GHz frequency range (ISM) and guarantees broad compatibility with many WLAN devices. However, due to heavy use of the 2.4-GHz range, interference is more common than in the less-used 5-GHz range.

### Setting the Right Standard in the FRITZ!Box

In order to be able to set the right standard for throughput, you must first switch to the Expert Mode on the user interface:

1.   Select the menu "Settings / Advanced Settings / System / Expert Mode".

2.   Select "Show expert settings" and then click "Apply".

You must configure the standard you want to use for the transmission rate in the FRITZ!Box. The settings is configured in the "Settings / WLAN / Radio Settings" menu, in the "Mode" field.

Note the following for the configuration of this setting:

In order to communicate with each other, the FRITZ!Box and all WLAN adapters must work in the same frequency band.

The standard you configure in the FRITZ!Box must be compatible with the standards of all WLAN adapters used in the WLAN.

Make a note of which standards the WLAN adapters in your network are compatible with and then set the correct mode based on this information.

### The Standard for Security

IEEE 802.11i    The WPA security mechanism is defined in the IEEE 802.11i standard. WPA2 is an extension of the familiar security mechanism WPA (Wi-Fi Protected Access).

The main feature of the extension of WPA to WPA2 is the AES-CCM encryption process.

| Mechanism | Encryption |
| --- | --- |
| WPA | TKIP (Temporary Key Integrity Protocol) |
| WPA2 | TKIP |
| | AES-CCM based on the extremely secure AES (Advanced Encryption Standard) procedure. CCM (Counter with CBC-MAC) defines how the AES procedure is applied to WLAN packets. |

FRITZ!Box supports the AES encryption procedure as part of the WPA2 mechanism, and the TKIP encryption procedure as part of the WPA mechanism. This means that the FRITZ!Box can be used in combination with any WLAN adapters that also support WPA2 with AES or WPA with TKIP.

## 8.2    Security

Security is of utmost importance within radio networks. Radio signals can also be received outside of office or residential spaces and abused for criminal purposes.

Therefore it is important that no unauthorized users can register in a WLAN to use its Internet access or shared network resources.

FRITZ!Box includes settings on various levels that contribute to the security of your WLAN and thus to the security of your computers.

### Encryption

The most important security setting is encryption. FRITZ!Box supports the security mechanisms WEP (Wired Equivalent Privacy), WPA (Wi-Fi Protected Access) and WPA2 as follows:

> As part of the WEP mechanism a static key is determined to serve for the encryption of the user data. The key must also be entered in the WLAN settings of the WLAN clients.

> The WPA and WPA2 mechanisms provide for authentication while the connection is being established. For this a WPA password must be defined.

When WPA is selected, the TKIP encryption method is used to encrypt the user data. In WPA2 the AES-CCMP encryption method is used.

The security mechanis selected must also be supported by your WLAN adapter.

The user data are encrypted using an automatically generated key. This key is regenerated at regular intervals.

The WPA password used may be 8 to 63 characters in length. For increased security, however, the password should be at least 20 characters long. Use numerals, letters and special characters and combine capitals and lower-case letters.

**Encryption Configured in the Factory Settings**

In the FRITZ!Box a combined encryption "WPA + WPA2" with the TKIP/AES-CCMP encryption method is preconfigured. This setting allows you to use WLAN adapters that support WPA (TKIP) or WPA2 (AES-CCMP) or both methods.

It is advisable to change the preconfigured WLAN key as soon as possible. Changes to the settings can be configured on the FRITZ!Box user interface.

**Changing the Encryption Method: Recommendations**

If your WLAN adapter supports an encryption method that is more secure than the one preconfigured in your FRITZ!Box, you should select the more secure encryption method in your FRITZ!Box.

To configure the best security settings possible with FRITZ!Box and your WLAN adapter, please note the following recommendations:

If your WLAN adapter supports WPA2 in accordance with the 802.11i standard:

– Enable WPA encryption.

– Select the WPA mode "WPA2 (CCMP)" or "WPA+WPA2".

– Replace the WPA key with a new, unique value.

If your WLAN adapter supports the WPA mechanism, but not the WPA2 mechanism:

– Enable WPA encryption.

– Select the WPA mode "WPA (TKIP)" or "WPA+WPA2".

– Replace the WLAN network key with a new, unique value.

If your WLAN adapter supports neither the WPA nor the WPA2 mechanism:

– Enable WEP encryption.

– Replace the WLAN key with a new, unique value.

We strongly recommend the use of a WLAN adapter that supports WPA or WPA2 (for instance, the AVM FRITZ!WLAN USB Stick). WEP is out of date and data encrypted with WEP can be deciphered within a few hours.

### WLAN Radio Network Name (SSID)

The factory settings of FRITZ!Box include a value of "FRITZ!Box Fon WLAN 7170" preset for the SSID (Service Set Identifier).

If an additional device with the same network name is located in the vicinity, it can occur that the WLAN adapter attempts to register there. Therefore you should change the SSID as soon as possible.

## 8.3    Frequency Range

WLAN uses the frequency range around 2.4 GHz in the ISM band, or, alternatively, the area around 5 GHz.

2.4-GHz Range    WLAN in the 2.4-GHz frequency band works in the same area as Bluetooth, microwave devices and many cordless telephones. This means that interference may occur within WLANs operated in the vicinity of such devices. Generally the only adverse effects are to the transmission rate; aborted connections and data losses are rare.

In Europe, 13 channels are provided for WLAN in the 2.4 GHz range. One channel has a bandwidth of 22 MHz. A 5-MHz interval is left empty between adjacent channels. That means that channels located directly next to each other may overlap and result in mutual interference. If several WLANs are operated within a small space, a distance of at least five channels should be left empty between each two channels used. For instance, if channel 1 is selected for one WLAN, the channels 7 through 13 can be selected for a second WLAN. This maintains the minimum distance between channels.

WLAN Autochannel    With the WLAN Autochannel function, the FRITZ!Box automatically searches for the channel subject to the least interference. Should problems with interference persist despite this function, try to identify the source of interference and switch it off manually.

Additional tips on interference in the WLAN radio network are presented in the section "Eliminating Disturbances Caused by Another WLAN Radio Network" from page 85.

## Allocation of the WLAN Channels in the 2.4-GHz Range

| Channel | Frequency (GHz) | Channel | Frequency (GHz) |
|---------|-----------------|---------|-----------------|
| 1 | 2.412 | 8 | 2.447 |
| 2 | 2.417 | 9 | 2.452 |
| 3 | 2.422 | 10 | 2.457 |
| 4 | 2.427 | 11 | 2.462 |
| 5 | 2.432 | 12 | 2.467 |
| 6 | 2.437 | 13 | 2.472 |
| 7 | 2.442 | | |

## 8.4    Increasing the WLAN Range Using WDS

You can extend the range in your wireless network using WDS (Wireless Distributed System). For this you need another WLAN access point in addition to the FRITZ!Box. One of the two WLAN access points works as the base station, the other as a repeater. The base station and repeater are connected to each other via WLAN. The base station then can use the repeater to reach even computers that would be located beyond its range without the repeater.
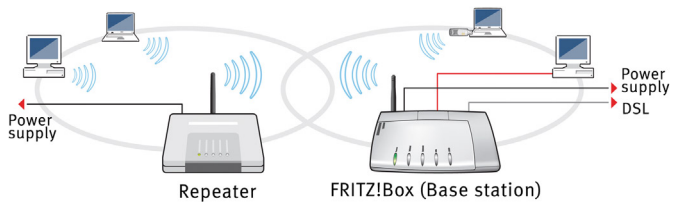


WDS: Expanding the WLAN range using a repeater

Please note:

In order to expand the range of your wireless network, you need at least one additional WLAN access point. The wireless network of your FRITZ!Box can be expanded to a WDS (Wireless Distributed System) with up to four WLAN access points.

All WLAN access points implemented in the WDS must support WDS and be configured for this technology.

All WLAN access points implemented as repeaters in the WDS must be located within the range of the base station.

When WDS in the FRITZ!Box is enabled, it can function as a base station to establish the Internet connection for other repeaters, or as a repeater to expand the range of a base station.

Make sure that the WLAN connections in the wireless network are encrypted for security.

Make sure that all WLAN access points in the WDS use the same radio channel.

Every access point participating in the WDS fulfills the tasks of a WLAN access point for its given WLAN clients. This means that the WLAN clients see each WLAN access point with an individual name (SSID) and individual encryption settings.

If you use the WLAN control software provided by the Windows XP Service Pack 2 on your WLAN clients, you can assign the same SSID and the same encryption settings to different WLAN access points. Each client can then automatically register at the WLAN access point with the best availability.

Make sure that each IP address is assigned only once in the wireless network.

### Enabling WLAN in the FRITZ!Box

Make sure that the "Show expert settings" option is enabled in the "System / Expert Mode" menu.

Perform the following steps:

1. Start your computer and open a web browser.

2. Enter `fritz.box` or `192.168.178.1` in the address line of your web browser and confirm by hitting the enter key. The FRITZ!Box user interface opens.

3. Click the "Settings" menu entry.

4. Click the "WLAN" menu entry.

5. Make sure that the wireless radio network (WLAN) is enabled.

   If necessary, enable the setting "Enable WLAN" in the "WLAN / Radio Settings" menu and click the "Apply" button.

6. Click the "Repeater" menu command.

7. Enable the "Enable support for WLAN repeater (WDS)" setting.

Now WDS support is enabled in your FRITZ!Box.

The next step is to specify whether the FRITZ!Box is to work as a base station or as a repeater. Continue with the following section for instructions.

## Specifying the WDS Mode for the FRITZ!Box

The FRITZ!Box can be configured as a base station or as a repeater:

> As a base station, the FRITZ!Box establishes Internet connections for other WLAN repeaters and WLAN clients.

> As a repeater, the FRITZ!Box extends the range of a base station in the wireless network.

### Configuring FRITZ!Box as a Base Station

The MAC address of the repeater must be determined before you can configure the FRITZ!Box as a base station.

1.  Connect the device you want to use as a repeater to your computer. Proceed as described in the corresponding documentation.

2.  Make note of the MAC address of the repeater or print it out.

    The MAC address is generally printed on a sticker on the base of the device. If the other repeater is a FRITZ!Box, the MAC address will be listed as "Local MAC Address of this FRITZ!Box" in the "WLAN / Monitor". You can also print out this information using the print command in your browser.

Once you have determined the MAC address of the repeater, you must register its address in the settings of the base station.

1.  To do this, reconnect the FRITZ!Box to your computer and open a web browser.

2.  Enter `fritz.box` in the address line of your web browser and confirm your entry by pressing Enter. The FRITZ!Box user interface opens.

3.  Open the "Operating Mode" settings page by clicking through the "Settings / WLAN / Repeater" menus and select the "Base station" option.

4.  Enter the MAC address of the repeater(s) with which you would like to extend your wireless network.

5.  Select on the "Security" settings page.

6.  Specify the type of encryption for the connection.

    WPA2 encryption can be used only if the repeater is also a FRITZ!Box. With other repeaters, WDS can only be used non-encrypted or with WEP encryption, since the WLAN standard is not stipulated for any other encryption with WDS.

7.  Enter a password.

8.  Click "Apply".

9.  The "Repeater Settings" window appears. It displays the repeater settings of the FRITZ!Box. We recommend printing out these settings by clicking the "Print Page" button.

This concludes the configuration of the FRITZ!Box as a base station.

Register the FRITZ!Box settings you printed out in each repeater operating in your wireless network. If you are using a FRITZ!Boxas a repeater, please read the next section.

## Configuring FRITZ!Box as a Repeater

First enable your base station for WDS operation and make sure that the WLAN function has been enabled.

1.  Open the "Operating Mode" settings page by clicking through "Settings / WLAN / Repeater" and select the "Repeater" option.

2.  Enter the MAC address of the base station here.

    The MAC address is generally printed on a sticker on the base of the device. If the base station is a FRITZ!Box, enter the address you printed out as described in the section "Configuring FRITZ!Box as a Base Station" on page 66.

3. Make sure that the FRITZ!Box and your base station are located in the same IP range and that both devices have been assigned an unique IP address.

   Please note that the repeater subsequently can only be reached via this new IP address!

4. Select on the "Security" settings page.

5. Set the kind of encryption used on your base station and use the same password as you did for the base station.

6. Click "Apply".

7. The "Repeater Settings" window appears. It displays the repeater settings of the FRITZ!Box. All settings must correspond to the settings in the base station.

This concludes the configuration of the FRITZ!Box as a repeater.

# 9    Network Settings

Upon delivery, the network settings of the FRITZ!Box are preconfigured as follows:

| Factory Settings | |
|---|---|
| All computers are located in the same IP network | enabled |
| IP address | 192.168.178.1 |
| Subnet mask | 255.255.255.0 |
| DHCP server | enabled |

According to these settings, all computers connected with the FRITZ!Box are located in the same subnetwork.

You can change any of these settings, but should only do so if you are well versed in network settings. If you do not have much experience in setting up networks, please read this chapter in full.

The "Basics" section explains terms and concepts having to do with IP networks.

The sections "IP Address", "DHCP Server" and "Subnetwork" explain when it may make sense to change the preconfigured network settings, what the effects of these changes are, and how to make the changes.

## 9.1    Basics

### What Is IP?

IP is the abbreviation for Internet Protocol.

The IP Internet Protocol is the most important basic protocol for the control of data exchange in local networks and in the Internet. The Internet protocol works without a connection; in other words, data packets are transmitted from the sender to the recipient without previous consultation. The addresses of the recipient and the sender in the data packets are given as IP addresses.

IP Network    A network in which data exchange takes place on the basis of the Internet Protocol is called an IP network.

### What Is an IP Address?

The term IP address is the abbreviation for Internet Protocol address.

The IP address corresponds to the "postal" address of a device located in the Internet or in a local IP network. So that data packets are sure to be delivered to the right address, each IP address may be assigned only once within the Internet or a local IP network.

The IP address consists of four three-digit groups of numbers (e.g. 192.168.178.154). Each group of numbers can assume values between 000 and 255.

IP addresses can be public or private, and also fixed or assigned dynamically.

**Public IP Address**  A public IP address is an IP address valid in the Internet. Every computer or router participating in the Internet must have a uniquely assigned public IP address. This address is usually negotiated dynamically with the Internet Service Provider when a connection to the Internet is dialed. The Internet Service Provider assigns the negotiated IP address to the computer or router for the duration of an Internet session.

**Private IP Address**  Private IP addresses are used for computers and other network devices within local IP networks.

Since many local IP networks are not connected to the Internet except via single computers or routers (gateway), certain address ranges are excluded from the publicly available IP addresses so that they are available for assignment in local IP networks. An IP address may only be assigned once within the local network. A private IP address may exist in any number of other local networks.

**Fixed IP Address**  Fixed IP addresses are IP addresses which are permanently assigned to a computer or another device like a network printer.

Assigning fixed IP addresses makes sense in cases where a local network has a sufficiently large pool of IP addresses available, or when a computer is always supposed to be accessible at a certain address (such as a web server or e-mail server).

**Dynamic IP Address**

A dynamic IP address is an IP address valid only for the duration of one Internet or network session.

Every computer participating in the Internet must have a uniquely assigned public IP address. Since only a limited number of such IP addresses is available, they must be used sparingly. That is why most of the Internet participants who dial in to the Internet receive a dynamic IP address. They are called dynamic because every participant receives a new public address that has not been assigned yet each time he or she dials in to the Internet.

By contrast, dynamic addresses are usually used in local IP networks because they are easy to handle, and because using them avoids incorrect IP address entries or unintentional double assignments. The DHCP service is responsible for assigning unique dynamic IP addresses.

## Subnetwork

A local IP network can consist of one subnetwork or be divided into multiple subnetworks. The division into subnetworks is performed when the local IP network is configured. The subnetworks of a local IP network are also IP networks.

**Subnet Mask**

The subnet mask indicates which part of an IP address is the network address and which the address of the computer. The network address defines what is called the subnet.

| Example 1 | |
| --- | --- |
| IP address: | 192.168.178.247 |
| Subnet mask: | 255.255.255.0 |

The assignment of the first three groups of numerals in the subnet mask indicates that the first three groups of numerals in the IP address define the network. The following addresses result:

| Example 1 | |
|---|---|
| Network address of the subnet: | 192.168.178.0 |
| Address of the computer in the subnet: | 192.168.178.247 |
| IP address pool in the subnet: | 192.168.178.0 - 192.168.178.255 |
| | The IP addresses 192.168.178.0 and 192.168.178.255 are reserved. This means that the addresses from 192.168.178.1 to 192.168.178.254 are available for assignment to the computers. |

| Example 2 | |
|---|---|
| IP address: | 192.168.178.247 |
| Subnet mask: | 255.255.0.0 |

The assignment of the first two groups of numerals in the subnet mask indicates that the first two groups of numerals in the IP address define the network. The following addresses result:

| | |
|---|---|
| Network address (subnet): | 192.168.0.0 |
| Address of the computer in the subnet: | 192.168.178.247 |
| IP address pool in the subnet: | 192.168.0.0 - 192.168.255.255 |
| | The IP addresses 192.168.0.0 and 192.168.255.255 are reserved. This means that the addresses from 192.168.0.1 to 192.168.255.254 are available for assignment to the computers. |

### What Is DHCP?

DHCP is the abbreviation for Dynamic Host Configuration Protocol.

DHCP is a protocol for the dynamic negotiation of the operating parameters for the TCP/IP protocol (TCP is a transport protocol based on the Internet protocol). The computers of a local IP network (DHCP clients) access the DHCP server as part of their operating systems' start procedure.

The DHCP server assigns each client an IP address that has not yet been assigned at the present time. The DHCP server also informs the client of the IP addresses of the DNS server to be used and of the default gateway. In assigning the IP addresses the DHCP server selects from a prescribed pool of IP addresses.

The central administration of the TCP/IP operation parameters makes it possible to avoid address conflicts due to IP addresses accidentally assigned more than once.

## 9.2 IP Address

The FRITZ!Box is delivered with an IP address preset.

| Factory Settings | |
| --- | --- |
| All computers are located in the same IP network | enabled |
| **IP address** | **192.168.178.1** |
| Subnet mask | 255.255.255.0 |
| DHCP server | enabled |

The IP address and the corresponding subnet mask automatically yield the following values:

| | |
| --- | --- |
| Network address of the subnet | 192.168.178.0 |
| Entire IP address pool for the computers | 192.168.178.2 - 192.168.178.253 |

You can change the preset IP address.

## When Does It Make Sense to Change the IP Address?

You should change the IP address of the FRITZ!Box if the following apply to your network:

> You have an existing local IP network, one subnet with several computers.

> Fixed IP addresses are registered in the network settings of the computer, and you do not want to or are not permitted to change these addresses.

> You want to connect the FRITZ!Box to the subnet in order to make the FRITZ!Box features available to all of the computers in the subnet.

### What IP Address Must You Assign for the FRITZ!Box and What Else Must Be Taken into Consideration?

> The IP address must come from the address range of your existing subnet.

> The subnet mask must correspond with that of the connected subnet.

> When the DHCP server of the FRITZ!Box is enabled, the addresses 20 through 200 in the fourth group of numerals of the IP address are reserved for the DHCP server. If none of the computers in your network has an address from this pool, the DHCP server can remain switched on. If one of the computers has a fixed address assigned from this pool, you should switch off the DHCP server.

> If you can no longer open the FRITZ!Box user interface after entering the IP address, see the information in the section "Errors Opening the User Interface" from page 80.

### Reserved IP Addresses

The following address range is reserved in FRITZ!Box for internal purposes.

| 192.168.180.1 - 192.168.180.254 |
|---|

IP addresses from this range may not be assigned to FRITZ!Box.

### How Can the IP Address Be Changed?

1. Open the FRITZ!Box user interface (see the section "Opening the User Interface" from page 30).

2. Click "Expert Mode" in the "System" menu, enable the setting "Show expert settings" and confirm this setting by clicking "Apply".

3. Open the "System / Network Settings" menu.

4. Click the "IP Addresses" button.

5. Make the changes on the "IP Settings" page and then click "Apply".

## 9.3 DHCP Server

FRITZ!Box is equipped with its own DHCP server. The DHCP server is enabled by default in the factory settings. Every time the operating system on a computer connected with FRITZ!Box is started, it is assigned an IP address by the DHCP server.

Only one DHCP server may be active within any network.

| Factory Settings | |
|---|---|
| All computers are located in the same IP network | enabled |
| IP address | 192.168.178.1 |
| Subnet mask | 255.255.255.0 |
| **DHCP server** | **enabled** |

The IP address, the corresponding subnet mask and the activated DHCP server automatically yield the following values:

| | |
|---|---|
| Network address of the subnet | 192.168.178.0 |
| Entire IP address pool for the computers | 192.168.178.2 - 192.168.178.253 |
| Address pool of the DHCP server | 192.168.178.20 - 200 |

In every subnet of the FRITZ!Box, the addresses 20 through 200 in the fourth group of numerals of the IP address are reserved for the DHCP server.

Assigning the IP addresses via the DHCP server ensures that all of the computers connected with the FRITZ!Box are located in a single subnet.

The computers can receive their IP addresses from the DHCP server only if the setting "Obtain an IP address automatically" is enabled in the their IP settings. For more information, see the section "IP Settings" from page 87.

### Fixed IP Addresses when the DHCP Server Is Enabled

If you would like to give fixed IP addresses to individual computers connected with the FRITZ!Box, despite the fact that the DHCP server is enabled, then you must disable the option "Obtain an IP address automatically" in this computer's network settings and enter the fixed IP address manually.

**Which IP Addresses Can You Assign to the Computers?**

The IP addresses must be from the same subnet as FRITZ!Box.

The IP addresses may not come from the address pool of the DHCP server.

If the factory settings are not changed, that means the following IP addresses are available:

| |
|---|
| 192.168.178.2 - 192.168.178.19 |
| 192.168.178.201 - 192.168.178.253 |

Each IP address can be assigned only once.

### Disabling the DHCP Server

You can switch off the DHCP server.

To make sure that all computers remain in the same subnet as the FRITZ!Box even when the DHCP server is disabled, you must enter the IP addresses manually in the computers' network settings. First disable the option "Obtain an IP address automatically" and then enter the IP address manually in the appropriate field.

In the case of the preset IP address of the FRITZ!Box, the following IP addresses are available for assignment to the computers:

192.168.178.2 - 192.168.178.253

Each IP address can be assigned only once.

### Changing the DHCP Server Settings

Proceed as follows to open the DHCP server settings:

1. Open the FRITZ!Box user interface (see the section "Opening the User Interface" from page 30).

2. Click "Expert Mode" in the "System" menu, enable the setting "Show expert settings" and confirm this setting by clicking "Apply".

3. Open the "System / Network Settings" menu.

4. Click the "IP Addresses" button.

   The "IP Settings" page is opened. Here you can make the settings for the DHCP server.

## 9.4    Subnetwork

By default the option "All computers are located in the same IP network" is enabled in the FRITZ!Box.

| Factory Settings | |
| --- | --- |
| All computers are located in the same IP network | enabled |
| IP address | 192.168.178.1 |
| Subnet mask | 255.255.255.0 |
| DHCP server | enabled |

If the factory settings were not changed, this setting has the following effect:

The DHCP server of the FRITZ!Box assigns all of the computers connected with the FRITZ!Box an IP address from the address pool of the DHCP server:

| | |
| --- | --- |
| Address pool of the DHCP server: | 192.168.178.20 - 200 |

This means that all of the computers connected with the FRITZ!Box are located in the same subnet.

Disabling "All computers are located in the same IP network"

If you switch off the setting "All computers are located in the same IP network", the interfaces of the FRITZ!Box will receive their own IP addresses. The following settings are configured by default:

| Interface | IP Address | Subnet Mask | DHCP Server |
| --- | --- | --- | --- |
| LAN 1 | 192.168.178.1 | The subnet mask 255.255.255.0 is set at every interface. | The DHCP server is enabled at every interface. |
| LAN 2 | like LAN 1 | | |
| LAN 3 | like LAN 1 | | |
| LAN 4 | like LAN 1 | | |
| WLAN | 192.168.182.1 | | |

This the following address pools are available to the DHCP server:

| Interface | Address Pool of the DHCP Server at the Interface |
|-----------|--------------------------------------------------|
| LAN 1 | 192.168.178.20 - 200 |
| LAN 2 | like LAN 1 |
| LAN 3 | like LAN 1 |
| LAN 4 | like LAN 1 |
| WLAN | 192.168.182.20 - 200 |

Computers connected with the FRITZ!Box via different interfaces are located in different subnets.

| Interface | Address Pool of the DHCP Server at the Interface |
|-----------|--------------------------------------------------|
| LAN 1 | 192.168.178.0 |
| LAN 2 | like LAN 1 |
| LAN 3 | like LAN 1 |
| LAN 4 | like LAN 1 |
| WLAN | 192.168.182.0 |

### Disabling the Setting "All computers are located in the same IP network"

Proceed as follows to open the DHCP server settings:

1. Open the FRITZ!Box user interface (see the section "Opening the User Interface" from page 30).

2. Click "Expert Mode" in the "System" menu, enable the setting "Show expert settings" and confirm this setting by clicking "Apply".

3. Open the "System / Network Settings" menu.

4. Click the "IP Addresses" button.

   The "IP Settings" page is opened. Here you can change the setting "All computers are located in the same IP network".

# 10 Troubleshooting

This chapter provides advice if you are not able to open the user interface of your FRITZ!Box, if you are having problems with the WLAN connection, or if you want to change the IP settings on your computer.

## 10.1 Errors Opening the User Interface

If you see an error message when you open the user interface, work through the following steps to find the source of the error and resolve the error.

Checking the Cable Connections

Make sure that all cable connections are plugged in securely.

Entering an IP Address

In the Internet browser, enter the following IP address in place of "fritz.box":

```
192.168.178.1
```

Obtaining an IP Address Automatically

The IP addresses of the connected computers must be assigned automatically (see "IP Settings" from page 87).

### Checking the Internet Browser Settings

Check the settings of the Internet browser:

1. The browser must use the network connection between the computer and FRITZ!Box when the user interface is opened.

2. The Internet browser must be in online operation.

3. If the Internet browser uses a proxy server, the DNS name and the IP address of the FRITZ!Box must be entered as exceptions in the proxy settings of the web browser.

4. The user interface must be allowed to execute CGI scripts.

The following example explains how to check the settings of Internet Explorer 6:

### Disabling Automatic Dial-up Connections

1. Select the "Connections" settings page under "Tools / Internet Options...".

2. In the "Dial-up and Virtual Private Network settings" section, enable the option "Never dial a connection".

3. As a final step, click "Apply" and then "OK".

### Configuring Internet Explorer 6 for Online Operation

1. Open the "File" menu.

2. If a checkmark is displayed in front of "Work Offline", click this line. The checkmark will be removed and Internet Explorer will switch to online operation.

### Entering the DNS Name and IP Address of the FRITZ!Box as Exceptions in the Proxy Settings of the Web Browser

1. Select the "Connections" settings page under "Tools / Internet Options...".

2. Click the "LAN Settings..." button in the "Local Area Network (LAN) settings" area, and in the next window, click the "Advanced..." button in the "Proxy server" area.

3. Under "Exceptions" enter:
   ```
   fritz.box; 192.168.178.1; 169.254.1.1;
   192.168.178.254
   ```
   and click "OK".

### Allowing Execution of CGI Scripts in the Internet Browser

1. Select "Tools / Internet Options... / Security".

2. If the "Default Level" button is not available for selection, the "Medium" security level is already configured, which means that CGI scripts can be executed in the Internet browser.

   Proceed as follows if the "Default Level" button is available for selection:

3. Select the "Local Intranet" icon and click the "Sites..." button.

4. In the next window, click the "Advanced..." button and enter in the "Add this Web site to the zone:" field:

   ```
   fritz.box
   ```

5. Disable the option "Require server verification (https:) for all sites in this zone".

## Checking the Protection Software

Protection software like firewalls and security software can block access to the FRITZ!Box user interface. Set exceptions for the FRITZ!Box in all active protection software.

If you would like to exit protection software to test access to the FRITZ!Box, remove the DSL cable first! After testing, first start the protection software before reinserting the DSL cable and connecting to the Internet!

## Restarting the FRITZ!Box

Restart the FRITZ!Box. Remove the power cable from the socket. Wait five seconds before reconnecting to the power supply.

If these points are all in order but you still have no access to the user interface, work through the following instructions:

## Opening the FRITZ!Box User Interface via a LAN Connection

The FRITZ!Box is equipped with a fixed IP address that cannot be changed. FRITZ!Box **always** can be reached at this IP address.

The fixed IP address at which the FRITZ!Box can always be reached depends on the firmware version.

| The new fixed IP address is: | 169.254.1.1 |
| The older fixed IP address is: | 192.168.178.254 |

The following section describes how to open the user interface in both the new and the old firmware versions. If you cannot open the user interface using the new fixed IP address, try again using the old fixed IP address.

**Opening the User Interface Using the New Fixed IP Address**

1. Connect the FRITZ!Box and the computer using the red LAN cable (see the section "Connecting Computer(s) to a LAN Port" from page 18).

2. Make sure that the computer obtains its IP address automatically. You can check this setting in the computer's IP settings (see section "IP Settings" from page 87).

3. Restart your computer.

4. Start your Internet browser and enter FRITZ!Box's fixed IP address:

   `169.254.1.1`

   The FRITZ!Box user interface opens.

5. Once you have reached the FRITZ!Box user interface again, you should check the FRITZ!Box settings and correct them if necessary.

**Opening the User Interface Using the Older Fixed IP Address**

1. Connect the FRITZ!Box and the computer using the red LAN cable (see the section "Connecting Computer(s) to a LAN Port" from page 18).

2. Take note of the computer's current IP settings.

3. Change the IP settings by entering the following fixed IP address:

   `192.168.178.250`

4. Start your Internet browser and enter FRITZ!Box's fixed IP address:

   `192.168.178.254`

   The FRITZ!Box user interface opens.

5. Once you have reached the FRITZ!Box user interface again, you should check the FRITZ!Box settings and correct them if necessary.

6. Enter the settings you noted in the computer's IP settings dialog.

## 10.2   The WLAN Adapter Cannot Find FRITZ!Box

If the "FRITZ!Box Fon WLAN 7170" radio network is not found by the WLAN adapter of a computer, work through the following steps to find the source of the error and resolve it.

### Making Sure that the WLAN Adapter is Ready for Operation

Make sure that the WLAN adapter is ready for operation. Some of the WLAN adapters installed in notebooks must be activated by flipping a switch on the notebook.

For questions on the WLAN adapter of your computer, please contact the manufacturer.

### Enabling WLAN in the FRITZ!Box Fon WLAN

If the "WLAN" LED on the FRITZ!Box is not lit up or is flashing, this means that WLAN is not enabled.

Press the WLAN switch on the back panel of the FRITZ!Box. The "WLAN" LED begins flashing and then lights constantly. This means that the WLAN function is enabled.

### Announcing the Name of the Radio Network

Make sure that the setting "Announce name of the radio network (SSID)" is enabled in the WLAN settings of the FRITZ!Box.

1.  Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the sections "Connecting Computer(s) to a LAN Port" from page 18.

2.  Start a web browser.

3.  Enter `fritz.box` in the address field.

4.  Select the "Settings" menu.

5.  Select the "WLAN / Radio Settings" menu and enable the setting "Announce name of the radio network (SSID)".

6.  Click the "Apply" button.

7. Remove the network cable and try again to establish a connection.

## Eliminating Disturbances Caused by Another WLAN Radio Network

If there is another WLAN radio network in the direct vicinity of your FRITZ!Box, you must ensure that there are at least five channels between the radio channels used by the two networks. Otherwise the frequency bands of the two radio networks will overlap and mutual interference may occur. A total of thirteen radio channels are reserved for WLAN.

If there is another WLAN radio network in the direct vicinity of your FRITZ!Box, test a different radio channel for your FRITZ!Box.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section "Connecting Computer(s) to a LAN Port" from page 18.

2. Start a web browser.

3. Enter `fritz.box` in the address field.

4. Select the "Settings" menu.

5. Open the "WLAN / Radio Settings" menu.

6. Select a different radio channel from the "Select radio channel" list.

7. Click the "Apply" button.

8. Remove the network cable and try again to establish a connection.

## 10.3   WLAN Connection Is Not Established

### Comparing the Security Settings for WLAN

Make sure that the WLAN security settings registered in the FRITZ!Box agree with the security settings of the WLAN adapter.

Here is how to view the WLAN security settings of the FRITZ!Box and print them out.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section "Connecting Computer(s) to a LAN Port" from page 18.

2. Start a web browser.

3. Enter `fritz.box` in the address field.

4. Select the "Settings" menu.

5. Select the "WLAN / Security" menu.

6. Click the "Apply" button.

   A window is displayed with the WLAN security settings. Print out this page by clicking the "Print Page" button at the upper left of the page.

7. Remove the network cable and try again to establish a connection.

### Testing the WLAN Connection Without Security Settings

Disable the WLAN security settings to test whether a WLAN connection between the FRITZ!Box and the WLAN adapter is possible at all.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section "Connecting Computer(s) to a LAN Port" from page 18.

2. Open the "WLAN / Security" menu and select "Enable Access without Encryption". As a final step, click "Apply".

This non-secured condition should be used only for testing, to find out whether a WLAN connection is possible at all.

3. Remove the network cable and try again to establish a connection.

If the attempt to connect to the WLAN using the non-encrypted connection is not successful either, check the installation of the WLAN adapter and contact the manufacturer of the WLAN adapter if necessary.

## 10.4 Connection via Microsoft WLAN Service Fails with WPA2

The WLAN connection to FRITZ!Box cannot be established using the Microsoft WLAN Service (WZC) in Windows XP Service Pack 2.

The required Microsoft patch for WPA2 (IEEE 802.11i) may not be not installed.

Support for WPA2 in Microsoft WLAN service was not available until the current patch for Microsoft Windows XP Service Pack 2. Install the current patch from Microsoft:

http://support.microsoft.com/kb/893357/EN-US

## 10.5 IP Settings

The FRITZ!Box is equipped with its own DHCP server. This means that FRITZ!Box assigns the connected computers their IP addresses. The connected computers must be configured such that they can receive their IP addresses automatically. The steps for checking and adjusting this option differ among the operating systems. See the relevant section for your operating system.

If FRITZ!Box is operated in a network, no other DHCP server may be activated in this network. If you need to operate a DHCP server, please disable the DHCP feature in the "Advanced System Settings".

**Obtaining an IP Address Automatically in Windows Vista**

Proceed as follows in Windows Vista:

1.  Click the "Start" button in the task bar and select "Control Panel / Network and Sharing Center".

2.  From the "Tasks", select "Manage network connections".

3.  In the "LAN or High-Speed Internet" area, select the LAN connection between your computer and the FRITZ!Box. Click the right mouse button and select "Properties".

4.  If the "User Account Control" window is displayed, click "Continue" in this window.

5.  Under "This connection uses the following items", select the "Internet Protocol Version 4 (TCP/IPv4)" entry and click "Properties".

6.  Enable the options "Obtain an IP address automatically" and "Obtain DNS server address automatically".
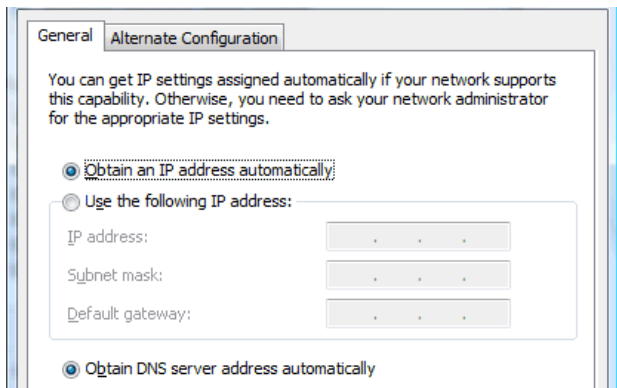


Properties of the Internet protocol (TCP/IP)

7.  Confirm your selection by clicking "OK".

    If necessary, repeat steps 5 through 7 for the "Internet Protocol Version 6 (TCP/IPv6)" as well.

The computer now receives an IP address from the FRITZ!Box.

**Obtaining an IP Address Automatically in Windows XP**

Proceed as follows in Windows XP:

1.  Go to "start / Control Panel / Network and Internet Connections / Network Connections" and double-click the LAN connection icon of the network adapter connected to FRITZ!Box.

2.  Click the "Properties" button.

3.  Select "Internet Protocol (TCP/IP)" in the list of items used in this network connection and click "Properties".

4.  Enable the options "Obtain an IP address automatically" and "Obtain DNS server address automatically".
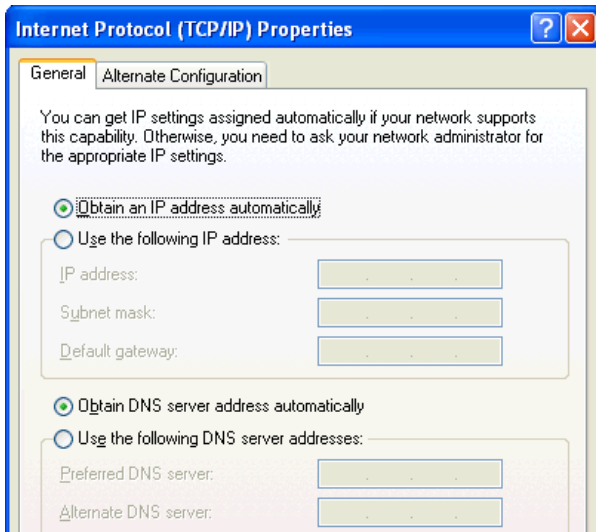


Properties of the Internet protocol (TCP/IP)

5.  Confirm your selection by clicking "OK".

The computer now receives an IP address from the FRITZ!Box.

**Obtaining an IP Address Automatically in Windows 2000**

Proceed as follows in Windows 2000:

1.  Select "Start / Settings / Control Panel / Network and Dial-up Connections".

2.  Click to select the LAN connection with the network adapter bound to FRITZ!Box.

3.  Click the "Properties" button.

4.  Double-click to select "Internet Protocol (TCP/IP)" in the list of network components.
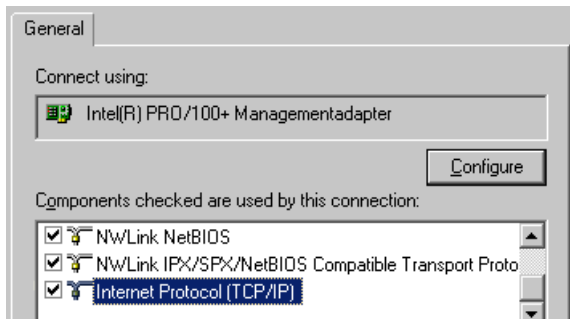


Properties of the LAN connection of a network adapter

5.  Enable the options "Obtain an IP address automatically" and "Obtain DNS server address automatically".
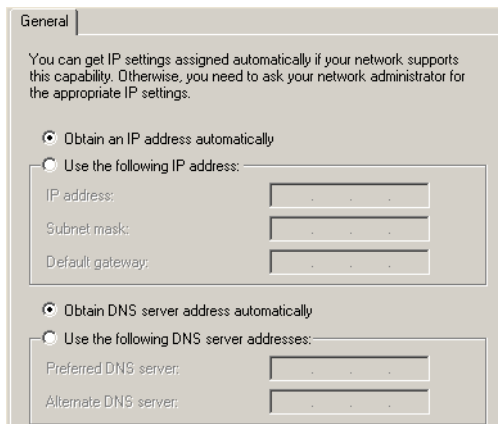


The "Obtain an IP address automatically" option

6.  Confirm your selection by clicking "OK".

The computer now receives an IP address from the FRITZ!Box.

**Obtaining an IP Address Automatically in Mac OS X**

In the Mac OS X operating system, proceed as follows to set the TCP/IP properties:

1.  Select the "System Preferences" in the Apple menu.

2.  In the "System Preferences" window, click the "Network" icon.

3.  In the "Network" window, select the "Built-in Ethernet" entry from the "Show:" drop-down menu.

4.  Switch to the "TCP/IP" settings page and select the "Using DHCP:" option from the "Configure IPv4" drop-down menu.

5.  Click "Apply Now".

The computer now receives an IP address from the FRITZ!Box.

**Linux**

For comprehensive information on the basics of network configuration in Linux, see, e.g.:
http://www.tldp.org/HOWTO/NET3-4-HOWTO-5.html

# 11 Removing the FRITZ!Box

This chapter describes how to:

disconnect the FRITZ!Box from the computer

uninstall the FRITZ!DSL software package

remove the printer port

remove the "FRITZ!Box" program group.

## 11.1 Disconnecting the FRITZ!Box from the Computer

LAN Ports
If the computer is connected to one of the LAN ports on the FRITZ!Box, simply remove the network cable.

If the computer is connected to the FRITZ!Box via a network hub or switch, remove the network cable between the computer and the network hub or switch.

WLAN
If the computer is connected to the FRITZ!Box wirelessly via WLAN, deactivate the WLAN connection to FRITZ!Box in the WLAN adapter of the computer.

## 11.2 Removing the FRITZ!DSL Software

You can remove the FRITZ!DSL software using the Control Panel of the Windows operating system.

### Removing FRITZ!DSL in Windows XP

Proceed as follows:

1.  Open "start / Control Panel / Add or Remove Programs". Make sure that the "Change or Remove Programs" button is selected in the column at left.

2.  Select the "AVM " entry from the list of "Currently installed programs".

3.  Click the "Change/Remove" button.

This concludes the removal of FRITZ!DSL.

## 11.3 Removing the Printer Port

The AVM FRITZ!Box printer port is removed using the Control Panel of the Windows operating system.

### Removing the Printer Port in Windows Vista

Proceed as follows:

1. Open "Start / Settings / Control Panel / Programs and Functions".

2. Select the "AVM FRITZ!Box Printer Port" entry from the list.

3. Click the "Uninstall/Change" button.

4. Confirm the next query by clicking "Continue".

This concludes the uninstallation of the printer port.

### Removing the Printer Port in Windows XP

Proceed as follows:

1. Open "start / Control Panel / Add or Remove Programs". Make sure that the "Change or Remove Programs" button is selected in the column at left.

2. Select the "AVM FRITZ!Box Printer Port" entry from the list of "Currently installed programs".

3. Click the "Change/Remove" button.

This concludes the uninstallation of the printer port.

### Removing the Printer Port in Windows 2000

Proceed as follows:

1. Open "Start / Settings / Control Panel / Add/Remove Programs". Make sure that the "Change or Remove Programs" button is selected in the column at left.

2. Select the "AVM FRITZ!Box Printer Port" entry from the list of "Currently installed programs".

3. Click the "Change/Remove" button.

This concludes the uninstallation of the printer port.

## 11.4    Removing the Program Group

Remove the "FRITZ!Box" program group using the Control Panel of the Windows operating system.

### Removing the Program Group in Windows Vista

Proceed as follows:

1. Open "Start / Settings / Control Panel / Programs and Functions".

2. Select the "AVM FRITZ!Box" entry from the list of currently installed programs.

3. Click the "Uninstall/Change" button.

4. Confirm the next query by clicking "Continue".

This completes uninstallation of the program group.

### Removing the Program Group in Windows XP

Proceed as follows:

1. Open "start / Control Panel / Add or Remove Programs". Make sure that the "Change or Remove Programs" button is selected in the column at left.

2. Select the "AVM FRITZ!Box" entry from the list of "Currently installed programs".

3. Click the "Change/Remove" button.

This completes uninstallation of the program group.

### Removing the Program Group in Windows 2000

Proceed as follows:

1. Open "Start / Settings / Control Panel / Add/Remove Programs". Make sure that the "Change or Remove Programs" button is selected in the column at left.

2. Select the "AVM FRITZ!Box" entry from the list of "Currently installed programs".

3. Click the "Change/Remove" button.

This completes uninstallation of the program group.

# 12 Configuration and Operation by Telephone

Many of the FRITZ!Box functions and features can be configured and used over a telephone connected to a FRITZ!Box extension. Only tone-dialing (dual-tone multifrequency = DTMF) telephones can be used in configuration and operation. Pulse dialing telephones are not suitable.

The telephone network features can be used only if they are supported by your telephone network carrier and enabled on your telephone line.

Entries input on the telephone are confirmed with an acknowledgement tone. Entries made correctly are confirmed with a positive acknowledgement tone (a single tone of one second in length). An error, such as an incorrect key sequence, is indicated by a failure tone, an intermittent tone at intervals of about 0.25 seconds.

For more information on the audio signals, see the section "Audible Signals" on page 134.

### Designation of the Functions and Features

Functions and features whose application has direct effects on the connection are marked with icons. The icons indicate the connection types with which the function or feature can be used or applied.

Functions and features that have no effect on the connection are not marked.

An overview of all of the icons used in this chapter is presented in the section "Symbols and Highlighting" from page 7 of this manual.

## 12.1   Operation by Telephone

This section describes how you can use the FRITZ!Box features via your telephone keypad.

### Shortening the Dialing Procedure

FRITZ!Box automatically recognizes when a number has been entered, but not until a few seconds after the final digits are entered.

To shorten the dialing procedure, enter the "#" character after the last digit of a number.

| | |
|---|---|
| ‹number›⏼ | indicates to FRITZ!Box that the number can be dialed immediately, thus shortening the dialing procedure |

### Enabling/Disabling WLAN

The WLAN function of FRITZ!Box can be switched on and off using the telephone keypad. This is especially comfortable when the WLAN function has been switched off. Simply use your telephone to turn it back on. This means that the WLAN function can be enabled without having use a wired connection to open the FRITZ!Box user interface.

| | |
|---|---|
| #96✱1✱ | enables the WLAN function of FRITZ!Box |
| #96✱0✱ | disables the WLAN function of FRITZ!Box |

**ISDN analog VoIP**

### Do Not Disturb

You can enable the Do Not Disturb function for any telephone connected to FRITZ!Box in the user interface. When Do Not Disturb is enabled, the telephone will not ring.

**Enabling Do Not Disturb Effective Immediately**

Use the following combination of keys to enable Do Not Disturb on an extension immediately. Do Not Disturb will remain enabled until you disable it.

| | |
|---|---|
| #81 ‹Ext.› ✱0✱ | immediately enables Do Not Disturb for extension entered as Ext. |

**Enabling Do Not Disturb for a Prescribed Period**

On any extension you can enter a Do Not Disturb period during which the telephone will not ring.

At the extension for which a Do Not Disturb period is to be configured, define the period during which the phone should not ring and save your entries. Then enable Do Not Disturb. Do Not Disturb will be switched on daily at the time entered in the "Start" field and switched off again at the time defined in the "End" field.

Example: Do Not Disturb should be configured from 20:00 p.m. until 07:00 a.m. daily. Enter the value 2000 for ‹Start› and 0700 for End.

| | |
|---|---|
| **#❽❶**‹Ext.›**✱** ‹Start›**✱**‹End›**✱** | defines the period for Do Not Disturb at extension Ext. |
| **#❾❶✱✱** | saves the settings in the FRITZ!Box |
| **#❽❶**‹Ext.›**✱❶✱** | enables Do Not Disturb for the defined period |

**Disabling Do Not Disturb**

| | |
|---|---|
| **#❽❶** ‹Ext.› **✱❻✱** | disables Do Not Disturb for extension Ext. |

## Alarm

The FRITZ!Box includes an alarm clock function. The alarm clock can be configured individually for each connected telephone.

### Configuring the Alarm for a Telephone

First enter on the telephone the time at which you would like to be awoken and save this entry. Then enable the alarm function.

Example: The telephone should ring to wake you at 07:00 a.m. Enter the value 0700 as ‹Time›.

| | |
|---|---|
| **#881**✻‹Time›✻‹Ext.›✻ | defines for the extension Ext. the time at which the telephone should ring |
| **#91**✻✻ | saves the settings in the FRITZ!Box |

### Enabling/Disabling the Alarm Function

| | |
|---|---|
| **#881**✻✻ | enables the alarm function for all extensions on which a time was configured |
| **#881#** | disables the alarm function for all extensions |

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## Selecting the Outgoing Number and the Type of Connection

For outgoing connections you can specify the kind of connection that should be used. For this entry you can use settings already made in FRITZ!Box or circumvent the settings currently configured in FRITZ!Box.

### Defining the Connection Type

You have the option of specifying the type of outgoing connection, independent of the settings configured in the FRITZ!Box. In this case the dialing rules are suspended for

the given dialing procedure. To do this, enter one of the following keypad codes before dialing a number on your telephone:

| | |
|---|---|
| ✶❶❶❶⌗ ‹number› | dials up this connection using the fixed line |
| ✶❶❷⌗ ‹number› | dials up this connection using the Internet (Internet number for access 1 |
| ✶❶❷ P ⌗ | establishes an Internet connection for a selected Internet number. For "P", enter the position of the Internet number in the "List of Internet Numbers" |

**Establishing a Connection Using a Selected Internet Number**

By placing an Internet Number ID before the number you can specify which of your Internet numbers should be used to conduct a telephone call.

If you enter an Internet number in the FRITZ!Box user interface, an ID for the Internet number is created automatically. The Internet Number ID is displayed in the "Telephony / Internet Telephony" menu of the user interface, in the "Internet Number ID" column of the list of Internet numbers.

| | |
|---|---|
| ‹Internet Number ID› ‹number› | establishes a connection for this call using the Internet number specified by the ‹Internet Number ID› |

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## Making Internal Calls

All calls conducted between telephones connected to the FRITZ!Box Fon WLAN 7170, be they analog or ISDN/DECT phones, are internal telephone calls. These calls are free of charge.

### Dialing Internal Calls with Automatic Outside Dialing

| | |
|---|---|
| ☏ | Pick up the handset. You hear the external dial tone immediately, since the extension is set for automatic outside dialing. |
| ⓡ or ✪✪ | Press the Hold button, or press the asterisk key twice. You now hear the internal dial tone. |
| ⌨❶ or ❷ or ⌨❺❶ or ⌨❺ MSN ⌗ | Dial "1" or "2" to call the connected analog telephones. |
| | Dial "50" to call all of the ISDN telephones for which no number is configured. |
| | Dial an MSN to call the ISDN telephones whose numbers are configured as this MSN. |

### Dialing Internal Calls without Automatic Outside Dialing

| | |
|---|---|
| ☏ | Pick up the handset. You hear the internal dial tone. |
| ⌨❶ or ❷ or ⌨❺❶ or ⌨❺ MSN ⌗ | Dial "1" or "2" to call the connected analog telephones. |
| | Dial "50" to call all of the ISDN telephones for which no number is configured. |
| | Dial an MSN to call the ISDN telephones whose numbers are configured as this MSN. |

## Group Call

The Group Call feature of FRITZ!Box allows you to ring all other extensions at the same time. To do so, you must first configure the extension for internal dialing. Your call is connected with whichever extension answers first.

| ☎ | Pick up the handset. |
| --- | --- |
| ❾ | Instead of an extension number, dial "9". All extensions that are not busy ring. |

## Picking up a Call from the Answering Machine

You can use this function to pick up incoming calls on your telephone after they have been accepted by the answering machine at a different extension. The other extension must be configured as an answering machine in the FRITZ!Box.

To pick up a call from another extension, proceed as follows:

| ☎ | Pick up the handset. |
| --- | --- |
| ✶❶❾ | Dial the sequence shown at left. |
| ☏ | The call is now connected to your extension, and you can talk with the caller. |

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## Alternating Between Calls

Whenever you have one active connection and one caller on hold, you can switch from one call to the other as often as you want using the Hold button.

To alternate between two connections, proceed as follows:

| | |
|---|---|
| Call 1<br>☎ | You are talking to Caller 1. |
| ® | Press the Hold button. Caller 1 is now on hold. |
| ⊞ | To establish a second call, simply dial ✷✷ plus the desired extension number for an internal call, or the desired external number. |
| Call 2<br>☎ | If the call is answered, you can consult on this line. The original caller is still on hold. |
| ®❷ | To switch back from Caller 2 to Caller 1, dial the sequence shown at left. |
| Call 1<br>☎ | Caller 1 is now active again and Caller 2 is on hold. |
| ®❷ | To switch back again from Caller 2 to Caller 1, dial the same sequence. In this way you can alternate between the two connections. |

The alternating connections can be ended in a number of ways:

| | |
|---|---|
| ☏ | The caller on hold hangs up. You can continue talking on the active connection. |
| ®❶ | You end the active connection by dialing the sequence shown at left. The call that was on hold is now active again, and there is no call left on hold. |
| ☏<br>☎<br>Call<br>☎ | You can also return to the call on hold by hanging up the handset: this ends the currently active connection. In this case the phone rings as soon as you hang up. Pick up the handset again to return to the last call that was on hold. |

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## Consultation / Hold

The "Consultation/Hold" feature allows you to place an existing call on hold. You then may consult with someone else at your workplace or dial a second call. The party on hold does not hear the second conversation. Once you have finished the consultation, you can return to the original connection.

To place a call on hold and then reactivate it, proceed as follows:

| Call 1 ☎ | You are talking to Caller 1. |
|---|---|
| ® | Press the Hold button. Call 1 is now on hold and you can consult someone else. |
| ⌗ | To establish a second call, simply dial ✱✱ plus the desired extension number for an internal call, or the desired external number. |
| Call 2 ☎ | If the call is answered, you can consult on this line. The original caller is still on hold. |
| ® | If the Caller 2's line is busy or the call is not answered, press the Hold button again to return to Caller 1. |
| ®➊ | To switch back to Caller 2 after talking to Caller 1, dial the sequence shown at left. Call 1 is now active again. |

If you return to Caller 1 by pressing the Hold button, the connection to Caller 2 is not cleared down until Caller 2 hangs up. Connection charges continue to accrue.

| Call 1 ☎ | You can also return to Caller 1 by hanging up the handset: this ends the connection to Caller 2. In this case, your phone rings as soon as you hang up. Pick up the handset to return to Caller 1 again. |
|---|---|
| ☎ | Hang up the handset to end the connection. |

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## Transferring Calls

The "Call Transfer" function allows you to transfer a connection from one of FRITZ!Box's extensions to the other. To do so, proceed as follows:

| Call 1 ☏ | You are talking to Caller 1. |
|---|---|
| ℞ | Press the Hold button. Caller 1 is now on hold. |
| ✪✪⊞ | To establish a connection to Caller 2, dial the star key twice and then her or his extension number. |
| Call 2 ☏ | You can now talk with Caller 2. |
| ☏ | To transfer Caller 1 to Caller 2, simply hang up the handset. |

## 12.2  Configuring by Telephone

### Restoring Factory Settings

The FRITZ!Box can be reset to its condition upon delivery.

All settings you made in the FRITZ!Box—including the configured Internet connection—are then deleted.

After restoring factory settings, the FRITZ!Box is restarted.

| #✪✪✪①✪①⑤⑨⓪①⑤⑨⓪✪ | resets FRITZ!Box to its condition upon delivery |
|---|---|

### Saving New Settings

In this section, saving refers to all current settings. It is not necessary to save the configuration after each setting is made. You may first configure all of your FRITZ!Box's settings as desired, and then save them permanently.

**Saving Permanently**

| | |
|---|---|
| ☎ | Pick up the handset. |
| #❾❶✪✪ | Save all settings made to your FRITZ!Box permanently by dialing the sequence shown at left. |
| ☎ | Hang up the handset. |

Permanent saving cannot be reversed. However, you can reset the PBX to its factory settings or program it with different settings.

**Disabling Automatic Outside Dialing**

| | |
|---|---|
| ☎ | Pick up the handset. |
| #❶Ext.✪❶✪ | Dial the sequence shown at left. |
| #❾❶✪✪ | Save your settings if desired by dialing the sequence shown at left. |
| ☎ | Hang up the handset. |

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### Call Waiting Option

Call waiting can be switched on or off for each extension. Some older terminal equipment connected to extensions may misinterpret the call waiting signal. This is especially true of fax machines and modems. If communication errors occur, you should disable call waiting for fax and modem extensions.

See section "Call Waiting" on page 121 for information about how to accept a call while another connection is active.

When "Call Waiting" is enabled, modem and fax connections may be interrupted.

### Disabling Call Waiting

| | |
|---|---|
| ☏ | Pick up the handset. |
| #❷Ext.✹❶✹ | Dial the sequence shown at left. |
| #❾❶✹✹ | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

### Enabling Call Waiting

| | |
|---|---|
| ☏ | Pick up the handset. |
| #❷ Ext. ✹❶✹ | Dial the sequence shown at left. |
| #❾❶✹✹ | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

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## Call Rejection on Busy (Busy on Busy)

Calls for an extension can be rejected using the "Busy on Busy" feature. This means that the user receives a busy signal whenever the extension is busy.

### Enabling the Busy on Busy Function

| | |
|---|---|
| ☏ | Pick up the handset. |
| #❺❷ Ext. ✹❶✹ | Dial the sequence shown at left. Type in the number of the extension in the "Ext." field. |
| #❾❶✹✹ | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

**Disabling the Busy on Busy Function**

| | |
|---|---|
| ☝ | Pick up the handset. |
| **#52** Ext. **✱0✱** | Dial the sequence shown at left. Type in the number of the extension in the "Ext." field. |
| **#9 1✱✱** | Save your settings if desired by dialing the sequence shown at left. |
| ☟ | Hang up the handset. |

## Room Monitoring (Baby Monitor)

The following key combination enables the function for monitoring the sound level in a room. First enter the volume level (a value between 1 and 8). Enter a telephone number. Do not hang up the handset! When the volume in the room reaches the specified level, the number you entered will be dialed. When the telephone rings and you pick up the handset, you will be connected with the telephone on which you enabled the room monitoring function.

When using this feature, it is advisable to activate the speaker phone function.

You can disable the function by simply hanging up the handset of the telephone at which you enabled it.

| | |
|---|---|
| ☎ | Pick up the handset or activate the speaker phone function of your telephone. |
| ✪➍ ‹level› ✪ ‹number› ⌗ | Dial the sequence shown at left. For "level", enter a number between "1" (the most sensitive sound level) and "8". For "number", enter the number to be called. This may be the number of another internal extension, a "9" for |
| ⚬ | Wait for the acknowledgement tone. The baby monitoring phone function is now enabled. |
| | Do **not** hang up the handset! |

Dial the number of the extension to listen in at an extension with room monitoring activated.

After initiating a room monitoring phone call, the PBX cannot generate a new call until at least one minute has lapsed.

## 12.3   Advanced Features

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### Call Diversion over FRITZ!Box

Incoming calls to the FRITZ!Box telephones can be diverted to a different extension or to an external number. In contrast to call diversion over FRITZ!Box, there is also call forwarding (call diversion via the central exchange). How to use call forwarding by phone is described in the section "Call Forwarding (Call Diversion via the Central Exchange)" from page 112.

Do not activate both call forwarding and call diversion at the same time.

Call diversion over FRITZ!Box allows you to forward calls to an external line or to another extension. This kind of diversion is organized inside FRITZ!Box so that diversions to an-

other extension are free of charge. Calls are diverted to an external number over your ISDN line's second B channel and are subject to normal transmission charges. If the FRITZ!Box is operated on an analog telephone line, incoming calls can only be diverted to a different extension or to numerical Internet numbers.

You can specify the conditions under which an incoming call will be diverted over FRITZ!Box. You can select one of six different options. Different settings may be saved for each extension.

Note that only numerical Internet numbers can be entered for diversion to an Internet number.

### Call Diversion Immediately (Without Ringing)

| | |
|---|---|
| ☎ | Pick up the handset. |
| **#④❶** Ext.✪ XNo./Ext. ✪ | Dial the sequence shown at left. |
| **#❾❶✪✪** | Save your settings if desired by dialing the sequence shown at left. |
| ☎ | Hang up the handset. |

### Call Diversion After the Third Ring

| | |
|---|---|
| ☎ | Pick up the handset. |
| **#④❷** Ext.✪ XNo./Ext. ✪ | Dial the sequence shown at left. |
| **#❾❶✪✪** | Save your settings if desired by dialing the sequence shown at left. |
| ☎ | Hang up the handset. |

### Call Diversion When Busy

| | |
|---|---|
| ☎ | Pick up the handset. |
| **#④❸** Ext.✪ XNo./Ext. ✪ | Dial the sequence shown at left. |
| **#❾❶✪✪** | Save your settings if desired by dialing the sequence shown at left. |
| ☎ | Hang up the handset. |

### Call Diversion After the Third Ring or When Busy

| | |
|---|---|
| ☎ | Pick up the handset. |
| #④④ Ext.✱ XNo./Ext. ✱ | Dial the sequence shown at left. |
| #⑨①✱✱ | Save your settings if desired by dialing the sequence shown at left. |
| ☎ | Hang up the handset. |

### Call Diversion Immediately by Ringing

| | |
|---|---|
| ☎ | Pick up the handset. |
| #④⑤ Ext.✱ XNo./Ext. ✱ | Dial the sequence shown at left. |
| #⑨①✱✱ | Save your settings if desired by dialing the sequence shown at left. |
| ☎ | Hang up the handset. |

### Disabling Call Diversion

| | |
|---|---|
| ☎ | Pick up the handset. |
| #④⓪ Ext. ✱✱ | Dial the sequence shown at left. |
| #⑨①✱✱ | Save your settings if desired by dialing the sequence shown at left. |
| ☎ | Hang up the handset. |

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### Using FRITZ!Box Features on the Analog Line

When FRITZ!Box is connected to an analog line, a feature can be activated directly at the switching station only if the line is set for this kind of configuration.

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱# ‹feature› | Dial the sequence shown at left. Next, enter the keyboard sequence your network provider has defined for the desired feature. The given keyboard sequence must be obtained from your network provider. |

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### Three-Party Conference Call

FRITZ!Box allows you to hold telephone conferences with two other people at once. Two external and one internal party, or two internal and one external party can conduct a conference call with each other.

You can set up a three-party conference as follows:

| | |
|---|---|
| 📞 | Pick up the handset. |
| ⌗ | Dial the external number of the first party. Talk. |
| **R** | Press the Hold button. |
| ⌗ | To establish a second call, simply dial ✱✱ plus the desired extension number for an internal call, or the desired external number. You can now talk to the second subscriber while your first call is on hold. |
| **R❸** | Dial the sequence shown at left to begin a three-party conference call. |
| ☍ | Now all three participants can confer together. If either of the other two parties hangs up, your connection with the remaining participant remains active. |
| 📞 | You can end the three-party call by hanging up the handset. |
| **R❷** | You can also switch from the three-party call back to the original two-party connection. Dial the sequence shown at left. This ends the three-party conference. The connection that was active last before you initiated the three-party conference is now active again. The other call is on hold. You can alternate between the two connections by dialing the same sequence again. |

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## Call Forwarding (Call Diversion via the Central Exchange)

Call forwarding is performed by the ISDN operator's switching station. To use call forwarding, FRITZ!Box must be connected to an ISDN line. Then this feature can be used to forward calls to an external line. Call forwarding is subject to charges by the network provider and cannot be used for forwarding calls to an Internet number.

In addition to call forwarding, there is also call diversion via FRITZ!Box. Use this kind of call diversion to divert calls to internal and external lines. See the section "Call Diversion over FRITZ!Box" from page 108 for more information.

Do not activate both call forwarding and call diversion at the same time.

For call forwarding you may specify whether you want incoming calls to be forwarded unconditionally, after the fifth ring, or when busy. Different settings may be configured separately for each number.

Call Forwarding
Immediately

Incoming calls for the given MSN are always diverted immediately to the specified number. Call forwarding can only be used to forward incoming calls to an external line. Call forwarding is subject to charges by the network provider and cannot be used for forwarding calls to Internet numbers.

**Call Forwarding Immediately for Your Extension's Outgoing Caller ID**

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱❷❶✱ XNo. # | Dial the sequence shown at left. |
| ⦿ | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Call Forwarding Immediately for Any MSN

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱❷❶✱   XNo. ✱ MSN ⌗ | Dial the sequence shown at left. |
| 💬 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Call Forwarding Immediately for All MSNs

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱❷❶✱ XNo. ✱⌗ | Dial the sequence shown at left. |
| 💬 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Disable Call Forwarding Immediately for Your Extension's Outgoing Caller ID

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱❷❶✱✱⌗ | Dial the sequence shown at left. |
| 💬 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Disable Call Forwarding Immediately for Any MSN

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱❷❶✱✱ MSN ⌗ | Dial the sequence shown at left. |
| 💬 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

**Disable Call Forwarding Immediately for All MSNs**

| ☎ | Pick up the handset. |
|---|---|
| ✶②❶✶✶⌗ | Dial the sequence shown at left. |
| 📞 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

Call Forwarding
When Busy

Incoming calls are only forwarded to the specified number if the extension dialed is busy. You can define call diversion for the local outgoing call number. The local outgoing call number is the first number you assigned to an extension. You can also define call diversion for any other number, e.g. a telephone at the other extension of FRITZ!Box, or for all numbers. All settings can be disabled at any time.

**Call Forwarding When Busy for Your Extension's Outgoing Caller ID**

| ☎ | Pick up the handset. |
|---|---|
| ✶❻❼✶ XNo. ⌗ | Dial the sequence shown at left. |
| 📞 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

**Call Forwarding When Busy for Any MSN**

| ☎ | Pick up the handset. |
|---|---|
| ✶❻❼✶  XNo. ✶ MSN ⌗ | Dial the sequence shown at left. |
| 📞 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Call Forwarding When Busy for All MSNs

| | |
|---|---|
| ☏ | Pick up the handset. |
| ✱❻❼✱ XNo. ✱# | Dial the sequence shown at left. |
| 📞 | Wait for the acknowledgement tone. |
| ☏ | Hang up the handset. |

### Disable Call Forwarding When Busy for Your Extension's Outgoing Caller ID

| | |
|---|---|
| ☏ | Pick up the handset. |
| ✱❻❼✱# | Dial the sequence shown at left. |
| 📞 | Wait for the acknowledgement tone. |
| ☏ | Hang up the handset. |

### Disable Call Forwarding When Busy for Any MSN

| | |
|---|---|
| ☏ | Pick up the handset. |
| ✱❻❼✱✱ MSN # | Dial the sequence shown at left. |
| 📞 | Wait for the acknowledgement tone. |
| ☏ | Hang up the handset. |

### Disable Call Forwarding When Busy for All MSNs

| | |
|---|---|
| ☏ | Pick up the handset. |
| ✱❻❼✱✱# | Dial the sequence shown at left. |
| 📞 | Wait for the acknowledgement tone. |
| ☏ | Hang up the handset. |

Call Forwarding
Delayed

Incoming calls are forwarded to the specified number if not answered at the number originally dialed within 20 seconds (about five rings). Call forwarding can be configured for your extension's outgoing caller ID (the first number assigned to an extension), for any number (for instance, a telephone at the other FRITZ!Box extension), or for all numbers. All settings can be disabled at any time.

### Call Forwarding Delayed for Your Extension's Outgoing Caller ID

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱❻❶✱ XNo. ⌗ | Dial the sequence shown at left. |
| 🕪 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Call Forwarding Delayed for Any MSN

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱❻❶✱    XNo. ✱ MSN ⌗ | Dial the sequence shown at left. |
| 🕪 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Call Forwarding Delayed for All MSNs

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✱❻❶✱ XNo. ✱⌗ | Dial the sequence shown at left. |
| 🕪 | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Disable Call Forwarding Delayed for Your Extension's Outgoing Caller ID

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✶➏➊✶# | Dial the sequence shown at left. |
| ⊙ | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Disable Call Forwarding Delayed for Any MSN

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✶➏➊✶✶ MSN # | Dial the sequence shown at left. |
| ⊙ | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

### Disable Call Forwarding Delayed for All MSNs

| | |
|---|---|
| ☎ | Pick up the handset. |
| ✶➏➊✶✶# | Dial the sequence shown at left. |
| ⊙ | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |

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### Caller ID Suppression for Outgoing Calls (CLIR)

The CLIR (Calling Line Identification Restriction) function prevents your telephone number being displayed on the other party's phone during outgoing calls.

The CLIR function is disabled in the factory settings. You have the option of enabling this function permanently and then disabling it again. CLIR can also be used for individual connections.

### Enabling CLIR Permanently

| | |
|---|---|
| ☏ | Pick up the handset. |
| **#❺❶** Ext. **✷❶✷** | Dial the sequence shown at left. Type in the number of the extension in the "Ext." field. |
| **#❾❶✷✷** | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

### Disabling CLIR Permanently

| | |
|---|---|
| ☏ | Pick up the handset. |
| **#❺❶** Ext. **✷❶✷** | Dial the sequence shown at left. Type in the number of the extension in the "Ext." field. |
| **#❾❶✷✷** | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

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## Displaying the Incoming Caller ID (CLIP)

The CLIP (Calling Line Identification Presentation) function makes the number of callers—external and internal—visible on your telephone display.

This feature is only effective if your telephone supports CLIP.

The CLIP function is enabled in the factory settings. This function can be permanently disabled and enabled again.

### Enabling CLIP

| | |
|---|---|
| ☏ | Pick up the handset. |
| **# 5 0** Ext. **✳ 1 ✳** | Dial the sequence shown at left. Type in the number of the extension in the "Ext." field. |
| **# 9 1 ✳ ✳** | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

### Disabling CLIP

| | |
|---|---|
| ☏ | Pick up the handset. |
| **# 5 0** Ext. **✳ 0 ✳** | Dial the sequence shown at left. Type in the number of the extension in the "Ext." field. |
| **# 9 1 ✳ ✳** | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

**ISDN** Connected Line Identification Restriction and Presentation (COLR / COLP)

By default, a caller's display always shows the Multiple Subscriber Number (MSN) of the extension she or he dialed. If you accept the call at another extension, the MSN of this extension will be displayed, as long as the caller is using an ISDN phone with the COLP feature enabled. If you do not want the caller to know that the call has been picked up at another extension (see page 101) and thus do not wish this number to be displayed, you have the option of suppressing transmission of the connected line's number. The caller's display will continue to show the number she or he called.

Transmission of the connected line's number can be switched on and off for each extension individually. Transmission of the connected line's number is permanently enabled in the PBX factory settings.

**Enabling Connected Line Identification Restriction Permanently**

To permanently disable transmission of the connected line's number (COLR), proceed as follows:

| | |
|---|---|
| ☏ | Pick up the handset. |
| **#❺❸** Ext. **✱❶✱** | Dial the sequence shown at left to disable transmission of the connected line number. Type in the number of the extension in the "Ext." field. |
| **#❾❶✱✱** | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

**Enabling Connected Line Identification Presentation Permanently**

To permanently enable transmission of the connected line's number (COLP), proceed as follows:

| | |
|---|---|
| ☏ | Pick up the handset. |
| #❺❸ Ext. ✱❶✱ | Dial the sequence shown at left to enable transmission of the connected line number. Type in the number of the extension in the "Ext." field. |
| #❾❶✱✱ | Save your settings if desired by dialing the sequence shown at left. |
| ☏ | Hang up the handset. |

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## Call Waiting

Enable the "Call Waiting" feature to be notified during a call if a second caller is dialing your line. An acoustic signal in your telephone handset notifies you that a second call is waiting. You can accept the connection with the new caller within 30 seconds. If you ignore the signal, the waiting call is rejected after 30 seconds.

For instructions on how to turn the "Call Waiting" function on and off, see the section "Call Waiting Option" on page 105.

| | |
|---|---|
| Ⓡ❷ | To accept a waiting call, dial the sequence shown at left. Your original call is now on hold. |
| Ⓡ❶ | To return to your original connection, dial the sequence shown at left. You can also accept the waiting call by hanging up your existing connection, i.e., by hanging up the handset. In this case the phone rings as soon as you have hung up. Pick up the handset again to accept the waiting call. |
| Ⓡ⓿ | To reject a waiting call, dial the sequence shown at left. |

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## Explicit Call Transfer (ECT)

With this feature you can connect two external parties with each other, when one connection has been active and the other has been on hold. Then you can end your own connection while the other two parties continue their conversation.

### Explicit Transfer of One Active and One Held Connection

| | |
|---|---|
| ☏ | Pick up the handset. |
| ⊞ | Dial the external number of the first party. Talk. |
| Ⓡ | Press the Hold button. |
| ⊞ | Dial the number for your second external call. You can now conduct a second conversation while your first call is on hold. |
| | To clear your connections while allowing the external parties to continue the call, connect the parties with each other. |
| Ⓡ❹ | Dial the sequence shown at left. The connection on hold and the active connection are connected with each other. The external parties continue the call while you clear the connection. |
| ☏ | Hang up the handset. |

### Explicit Call Transfer from a Three-party Conference Call

| | |
|---|---|
| ☏ | Pick up the handset. |
| ⊞ | Dial the external number of the first party. Talk. |
| Ⓡ | Press the Hold button. |
| ⊞ | Dial the number for your second external call. You can now conduct a second conversation while your first call is on hold. |
| Ⓡ❸ | Dial the sequence shown at left to begin a three-party conference call. |
| ☺ | Now all three participants can confer together. If either of the other two parties hangs up, your connection with the remaining participant remains active. |

| | |
|---|---|
| | To clear your connections while allowing the external parties to continue the call, connect the parties with each other. |
| **R②** | You can also switch from the three-party call back to the original two-party connection. Dial the sequence shown at left. This ends the three-party conference. The connection that was active last before you initiated the three-party conference is now active again. The second external call is on hold. You can alternate between the two connections by dialing the same sequence again. |
| **R④** | Dial the sequence shown at left. The connection on hold and the active connection are connected with each other. The external parties continue the call while you clear the connection. |
| **⏻** | Hang up the handset. |

**ISDN**

### One-time Explicit (External) Call Transfer

Explicit Call Transfer (ECT) is an ISDN feature that must be enabled by your ISDN provider and thus usually is subject to extra charges. If ECT has not been enabled on your line, you can program the PBX to initiate a one-time explicit call transfer before connecting to two parties. When you end the connection, the other two parties will be connected to each other. Proceed as follows:

| | |
|---|---|
| ☏ | Pick up the handset. |
| ✴❸❷⌗ | Dial the sequence shown at left. You hear the external dial tone. |
| ⊞ | Dial the external number of the first party. Talk. |
| ® | Press the Hold button. |
| ⊞ | Dial the number for your second external call. You can now conduct a second conversation while your first call is on hold. |
| | To clear your connections while allowing the external parties to continue the call, connect the parties with each other. |
| ®❹ | Dial the sequence shown at left. The connection on hold and the active connection are connected with each other. The external parties continue the call while you clear the connection. |
| ☏ | Hang up the handset. |

With this type of external transfer, both parties are connected to each other over your PBX. This means that both B channels on your ISDN line remain busy with this connection as long as the parties are connected to each other.

**ISDN**

## Call-back on Busy (CCBS)

When you dial a number and it is busy, enable this feature. As soon as the line is free, your telephone rings for 20 seconds, as it would for an external call. When you pick up your handset, the number of desired party will be dialed automatically.

This feature is supported for both external and internal connections.

A maximum of five call-back requests can be enabled for each extension at any given time.

To enable this feature, proceed as follows:

| | |
|---|---|
| ⊞ | You have just dialed a number and now you hear the busy signal. |
| ❺ | If the call is not answered, within twenty seconds, dial either the number "5" |
| | or |
| ®✱❸❼⌗ | the sequence shown at left. |
| ⊙ | Wait for the acknowledgement tone. |
| ☎ | Hang up the handset. |
| ✆ | As soon as the subscriber you dialed hangs up, your telephone will ring. |
| ☎ | Pick up the handset. The subscriber's number is dialed again automatically. |

**ISDN**

## Call-back on no Response (CCNR)

This function can be used when you dial a number and the party does not respond. Once the party can be reached again and conducts a call from her or his phone, this function recognizes when this conversation is ended. Your phone then rings as for an external call. When you pick up your handset, the number of the desired party is automatically dialed again.

This feature is supported for both external and internal connections.

This command can be activated five times for each line.

To enable this feature, proceed as follows:

| | |
|---|---|
| ⊞ | You have just dialed a number and hear a ring tone. |
| ❺ | If the call is not answered, within twenty seconds, dial either the number "5" |
| | or |
| Ⓡ✱❸❼# | the sequence shown at left. |
| ⊙ | Wait for the acknowledgement tone. |
| ☏ | Hang up the handset. As soon as the party you dialed completes the conversation being conducted from her or his phone, your phone rings. |
| ☏ | Pick up the handset. The number of the remote party is dialed automatically. |

Callback requests can also be deleted manually, with the oldest call-back request being deleted first.

| | |
|---|---|
| ☏ | Pick up the handset. |
| #❸❼# | Dial the sequence shown at left. |
| ☏ | Hang up the handset. |

**ISDN**

Call Tracing (MCID)

During a call or after the caller hangs up, dial the following sequence:

| | |
|---|---|
| Ⓡ✱❸❾# | Dial the sequence shown at left. |

For more information about this feature, contact your ISDN provider.

**ISDN**

## Suspend/Resume

The "Suspend/Resume" feature, also known technically as Terminal Portability, allows you to suspend an existing connection and resume it at another point on the $S_0$ bus. The connection can be resumed at a different ISDN terminal device (such as an ISDN telephone) that is connected to your BRI line along with the FRITZ!Box.

To suspend a call, proceed as follows:

| ☎ | You are talking to Caller 1. |
|---|---|
| ® | Press the Hold button. Call 1 is now suspended. |
| ✵❶PC✵ | Dial the sequence shown at left. Type in the parked-call ID as "PC". The parked-call ID can be any number between 0 and 99. You will need to enter this ID again when you resume the call. |

You will hear an acknowledgement tone to indicate that the call has been successfully suspended. If you hear the failure tone, this may indicate that you made a mistake, or that the "Suspend/Resume" feature is not enabled on your line. It is also possible that the parked-call ID you chose is already in use.

| ⊕ ☎ | After the acknowledgement tone, the connection is suspended. You can hang up the handset. The call remains suspended at the ISDN provider's local switch for two minutes. |
|---|---|

To resume the connection, proceed as follows:

| ☎ | Pick up the handset again. (You must not have a call on hold. Otherwise, FRITZ!Box will attempt to suspend it.) |
|---|---|
| ✵❶PC✵ | Dial the sequence shown at left. Type in the parked-call ID as "PC". The parked-call ID is the number you entered when you suspended the call. |

**ISDN**

## Using Keypad Messages

The FRITZ!Box offers the "keypad" function. This function allows ISDN services and features to be controlled by entering characters and strings on the telephone keypad. These keyboard entries are called keypad messages. Keypad sequences allow you to use ISDN services and features that may not be supported by your ISDN terminal device.

Ask your ISDN provider for the specific keypad messages to access ISDN features.

**Entering Keypad Messages on an Extension with Automatic Outside Dialing**

| ☏ | Pick up the handset. |
|---|---|
| ✱ # Seq | Dial the sequence shown at left. "Seq" stands for the keypad sequence you received from your ISDN provider. |

**Entering Keypad Messages on an Extension without Automatic Outside Dialing**

| ☏ | Pick up the handset. |
|---|---|
| 0 ✱ # Seq | Dial the sequence shown at left. "Seq" stands for the keypad sequence you received from your ISDN provider. |

# 13    Customer Service Guide

AVM provides numerous sources of information to assist you should any questions or problems arise. Here you will find the important information you need, in the form of manuals, updates and support.

In many cases problems which arise during operation can be resolved by installing the current Microsoft Service Pack for your operating system. The current service pack can be obtained directly from Microsoft.

## 13.1    Product Documentation

To take advantage of all commands and features of your FRITZ!Box, consult the following product documentation:

Manual
The manual is included in PDF format in the "INFO" folder on the FRITZ!Box CD.

You can install the Acrobat reader to view PDF documents from the "Info" folder of the FRITZ!Box CD.

Readme
The Readme file contains current information which was not yet available at the time the manual was completed. The Readme file is included on the FRITZ!Box CD.

Help
In the FRITZ!Box user interface you can open the detailed Help by clicking the "Help" buttons.

## 13.2    Information in the Internet

On its web site AVM presents comprehensive information on your AVM products as well as new product announcements and new product versions.

### Frequently Asked Questions (FAQs)

We would like to make our products as easy to use as possible. If you still have problems, sometimes a little tip is all you need to resolve them. That is why we present you with a selection of frequently asked questions.

The FAQs can be viewed at the following address:

www.avm.de/en/service/FAQs

## 13.3 Updates

AVM provides updates of the drivers and the firmware for the FRITZ!Box for free downloading over the Internet.

Use your FRITZ!Box user interface to update the firmware. Use the "System / Firmware Update" command to download the firmware from the Internet and perform the update.

The latest software and updates are available for download at the following address:

www.avm.de/en/download

Experienced users can also download updates from the AVM FTP server. Click the "FTP Server" link in the download area, or enter the following address:

ftp.avm.de

## 13.4 Support from the AVM Service Team

Should problems with your FRITZ!Box arise, we recommend taking the following steps:

1.  If you have questions about starting operation of your FRITZ!Box, please consult the chapter "Launching FRITZ!Box Operation" from page 14.

    Please see the information in the section "Product Details" from page 133.

2.  If anything does not work, seek "first aid" by consulting the chapter "Troubleshooting" from page 80.

    This chapter also presents useful tips on problems with establishing connections.

3. The next step is to consult the FAQs in the Internet: www.avm.de/en/service/faqs. This site contains answers to questions our customers have frequently asked our Support team.

4. If you do not find an answer to your question in the existing FAQs, the AVM Support Team will assist you with tips and resolutions for working with the FRITZ!Box. The support desk can be reached by e-mail or by fax.

Please take advantage of the information sources described above before contacting AVM support.

## Support by E-mail

You can send us an e-mail request at any time using the support area of our website. The support area can be reached at:

www.avm.de/en/service/support

Then click the "Mail Form‹" link to open the e-mail support form. Fill out the form and send it to AVM support by clicking the "Send" button. Our Support team will respond by e-mail as quickly as possible.

## Support by Fax

If necessary, you can reach AVM Support at the fax in English number:

+49 (0)30 / 39 97 62 66

The following information should be included in your fax to the Support team:

Your name and address.

An e-mail address or fax number at which you can be reached.

the serial number of the FRITZ!Box

The serial number is printed on the sticker attached to the base of the device. Support staff will always check this number to ensure that you are a registered user.

Which operating system are you using (e.g., Windows Vista or Windows XP)?

How is the FRITZ!Box connected to your computer, with a network cable or via WLAN?

At what step of the installation or in which application does an error occur or an error message appear? What is the exact wording of the message?

Which firmware does FRITZ!Box use? The firmware version is displayed on the "Overview" page of the FRITZ!Box user interface.

Once you have put together this information, please fax it to AVM Support. The Support team will assist you in resolving your problem.

# 14 Product Details

This chapter provides you with product details on FRITZ!Box. You receive detailed technical data and information on the LEDs.

## 14.1 FRITZ!Box Fon WLAN LEDs

The LEDs on the FRITZ!Box Fon WLAN 7170 indicate the following conditions:

| LED | | Meaning |
|---|---|---|
| Power/DSL | on | FRITZ!Box Fon WLAN 7170 ready for operation; power supply is connected and the DSL line is ready for operation |
| | flashing | The device is connected to the power mains, but the connection to DSL has been lost |
| Internet | on | a telephone connection to the Internet is active |
| | flashing | there are messages in your mailbox (this function must be supported by your Internet telephony provider) |
| Fixed Line | on | a telephone connection to the fixed-line network is active |
| | flashing | there are messages in your mailbox (this function must be supported by your Internet telephony provider) |
| WLAN | on | the WLAN function is enabled |
| | flashing | the WLAN function is being enabled or disabled |
| INFO | on | a telephone connection between two Internet telephony subscribers is active; the call is free of charge (this feature must be supported by your Internet telephony provider)<br><br>signals an event specified by the user<br><br>the Stick & Surf procedure has been concluded |
| | flashing | the value specified for the online meter has been reached<br><br>firmware is being updated<br><br>signals an event specified by the user<br><br>Stick & Surf procedure in progress |

## 14.2   Audible Signals

The following diagram illustrates the duration and intervals of the various handset and ring signals on the connected telephones.

| Time in seconds | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |

**Audible Signals**

Ring

Busy signal

Internal dial tone

External dial tone

Positive confirmation

Neg. acknowledgment

Call waiting

**Calls**

External call

Internal call

Call back

**Internet telephony**

Registration error

Fixed-line substitute
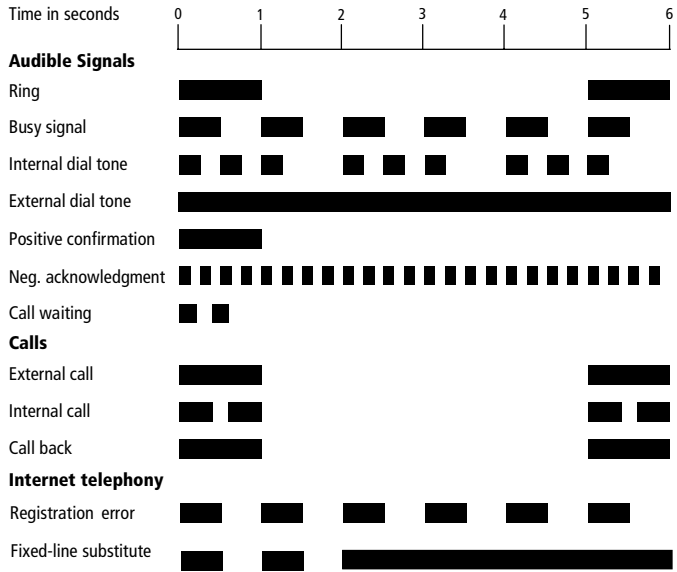
Handset and ring patterns on FRITZ!Box Fon WLAN 7170

### 14.2.1 Cables and Sockets

See the information in the following section on the individual cables and sockets on the FRITZ!Box Fon WLAN 7170.

### 14.2.2 DSL/Telephone Cable

The DSL/telephone cable is a special combined cable 4.25 m in length, developed by AVM to connect the FRITZ!Box Fon WLAN 7170 to the DSL splitter and the ISDN NT or analog telephone line.

If you would like to extend the cable, you have the following possibilities:

**DSL Cable Extension**

To extend the gray end of the combined cable, the one labeled "DSL", you will need the following components:

   1 standard network cable

   1 standard RJ45 CAT5 double coupling

All components are available from specialized vendors.

Remember that the quality of the line may be decrease as the distance from the central switching station increases.

**Telephone Cable Extension**

To extend the black end of the combined cable you will need the following components:

   1 standard network cable

   1 standard RJ45 CAT5 double coupling

All components are available from specialized vendors.

 AVM recommends that the standard network cable be extended by no more than 10 meters.

### Network Cable

Additional network cable is required if you would like to use all of the FRITZ!Box network ports.

The FRITZ!Box network cable is a standard Ethernet cable. If you need a replacement cable, a longer cable or an extension, use a standard STP-type (Shielded Twisted Pair, 1:1) CAT5 Ethernet cable. To extend the cable you will also need a standard CAT45 double coupling link to RJ5. You can use either straight cable or cross-link cable.

All components are available from specialized vendors.

AVM recommends that the standard network cable be extended by no more than 100 meters.

## 14.3 WLAN Switch

The FRITZ!Box Fon WLAN 7170 is equipped with a WLAN switch on its rear panel.

The WLAN switch can be used to activate and deactivate WLAN.

## 14.4 Technical Specifications of FRITZ!Box Fon WLAN 7170

### Ports and Interfaces

DSL / fixed line

– Standard ITU G.992.1 Annex A or Annex B (depending on the FRITZ!Box model)

– Fixed line port for connecting to the analog network or ISDN

two a/b ports for connecting two extensions via RJ11 sockets

one a/b port for connecting an extension using cable clamps

one ISDN $S_0$ NT port

$S_0$ bus with support for ISDN telephony devices; the CIP services voice, telephony, audio 3.1 and fax G2/G3 are supported

four LAN ports via RJ45 sockets
(standard Ethernet, 10/100 base-T)

one USB host controller (USB version 1.1)

WLAN

WLAN Access Point with support for radio networks in accordance with IEEE 802.11b (11 MBit/s) and IEEE 802.11g (54 MBit/s); the 802.11g++ standard is also supported and can be used in combination with a compatible WLAN adapter

### Router Functions

DSL router

DHCP server

Firewall with IP masquerading/NAT

### User Interface and Display

Configuration and status messages via an Internet browser of a connected computer

Five LEDs indicate the condition of the device

### Physical properties

Dimensions (WxDxH): approx. 185 x 140 x 35 mm

Supply voltage: 230 V / 50 Hz

Maximum power consumption: 12 W

Average power consumption: 6 W

Firmware can be updated

Conform to CE standards

# Index

# Declaration of CE Conformity

| | |
|---|---|
| **The manufacturer** | AVM GmbH |
| Address | Alt-Moabit 95 |
| | D-10559 Berlin |

**herewith declares that the product**

| | |
|---|---|
| Product | FRITZ!Box Fon WLAN 7170 |
| Type | ADSL-WLAN Router |

**complies with the following directives:**

| | |
|---|---|
| 1999/5/EC | R&TTE Directive:<br>Radio Equipment and Telecommunications Terminal Equipment |
| 89/366/EEC | EMC Directive:<br>Electromagnetic Compatibility |
| 73/23/EEC | Low Voltage Directive:<br>Electrical equipment designed for use within certain voltage limits |

The following norms were consulted to assess conformity:

EN 60950-1:2006
CTR 3/1998.06.17
ETSI TS 101 388
ITU-T G.992.1
ITU-T G.992.5
ITU-T G.994.1
ETSI ETR 328
EN 301 489-17 V1.2.1 (2002)
EN 301 489-1 V1.5.1 (2004)
EN 55024/9.98 + A1/10.01 + A2/01.03
EN 300 328 V1.6.1 (11.2004)

CE ⚠ The CE symbol confirms that this product conforms with the above mentioned norms and regulations.

Berlin, 15-11-2005          Peter Faxel, Technical Director

**Indication of Countries**

The radio technology of this device is designed for use in all countries of the European Union and in Switzerland, Norway and Iceland. In France only indoor operation is permitted.